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FORMERLY SAFETY ENGINEERING

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EST. 1901

OCTOBER, 1952
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#327

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(For further details, use Key Letters "AO" on Reader's Inquiry Card on page 115)

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The Magazine of Safety

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EST. 1901

VOL. 104, NO. 4 OCTOBER, 1952

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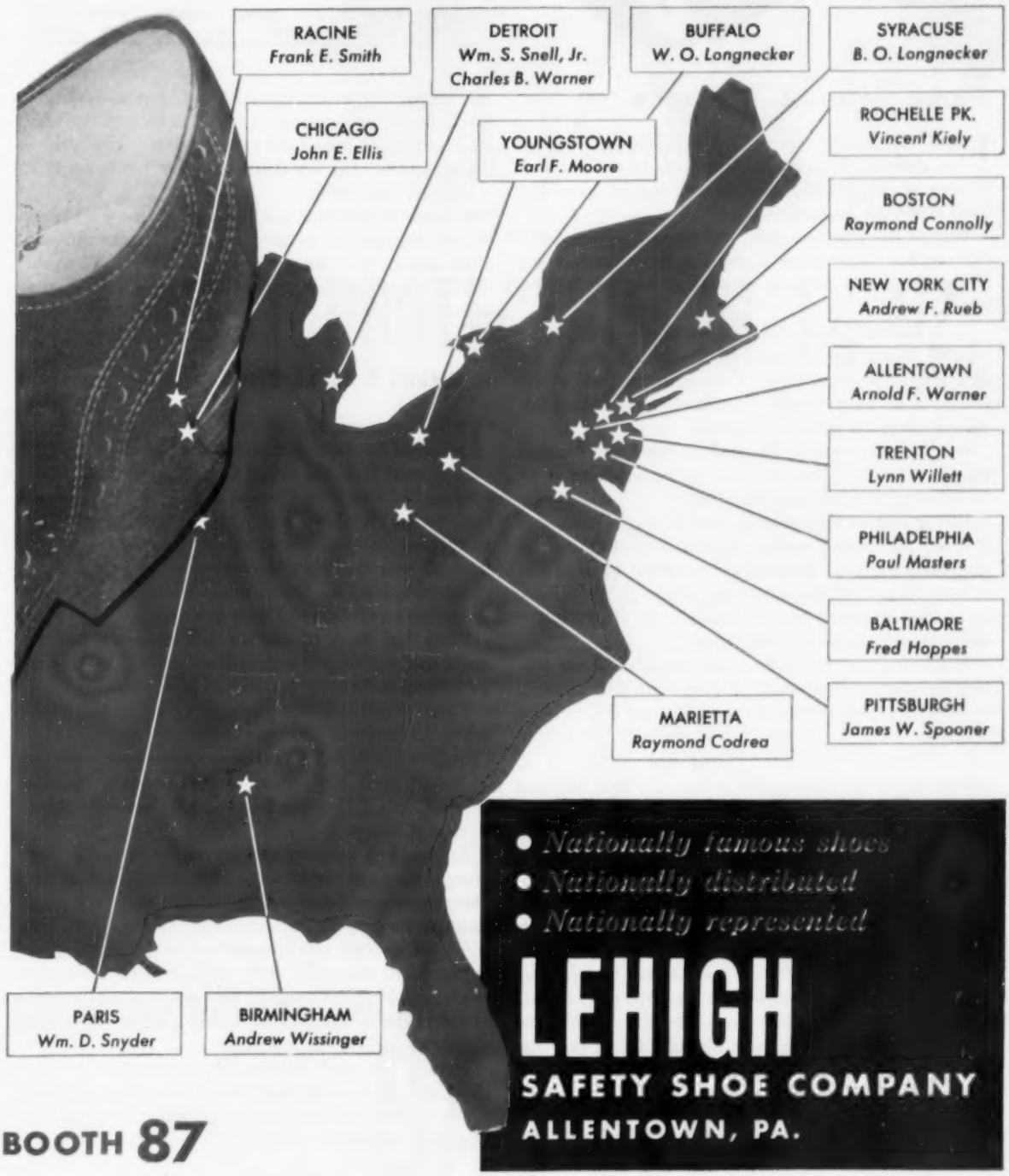

BOOTH 87

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It's Safe to Say

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★ OUR NATIONAL DISGRACE

FOR the past several years, the public has been so conditioned by constant references to millions and billions of dollars that astronomical figures have lost their power to impress.

Within the past ten years, our country-wide fire loss has doubled to the point of reaching three-quarters of a billion dollars—a national disgrace of the first magnitude.

It is perfectly true that fire loss figures reflect the present inflationary trend. Nevertheless, allowing for doubling of all other costs, it would seem that, at the very least, we have stood still in our efforts to reduce this burden upon the nation's economy.

It is a tragic commentary indeed upon our vaunted efficiency to learn that we have gotten nowhere at all in reducing the daily sacrifice to fire.

Rising cost of replacement, loss in wages, taxes and reduced purchasing power all add their toll to this staggering fire loss. Broken homes caused by lives lost in fires, to say nothing of earning stoppage, never show up in dull statistics; but the loss is right there, as too many families know to their sorrow.

While industry generally is very mindful of fire control and has invested wisely in large sums for detecting and extinguishing equipment, management is not always blameless when fire strikes. In many places, extinguishing devices are outmoded, downright useless or so placed as to be inaccessible when the first precious seconds count most.

The thoughtless use of matches and poor smoking habits continue to head the list of fire causes. Here is a prime opportunity for alert management to inculcate a healthy respect for fire. Flammable liquids, vapors and substances require the constant attention of experts who can—and do—anticipate the spread of fire.

In the final analysis, home owners and renters from one end of the country to the other are the chief offenders in the matter of indifference to fire. Overloaded circuits, frayed cords, poor insulation, unsafe practices all lead to ruin and it is the exception, rather than the rule, to find a household equipped with even one fire extinguisher.

We are the most insurance-minded nation on earth but, millions of private citizens, who keep an antiseptic handy in the medicine chest, seem to balk at the need for investing in household extinguishers. This faith in the ability of local fire departments to arrive on time is not very practicable.

It would appear that sabotage is dramatic only when we are engaged in an all-out war. The wasteful and often ruinous price we pay in fire losses, reflected in the cost of all commodities, is nothing short of perpetual sabotage.

★ THERE'S STILL TIME

THE most imposing safety convention program ever devised has been distributed in connection with the 40th Annual National Safety Congress and Exposition, opening in Chicago on October 20th.

Gathered together for a week, will be an essembly comprising accident preventionists and safety experts from all over the world except, of course, from those countries behind the Iron Curtain where life safety is a matter for an all-powerful state to decide.

Three full floors of exhibits will be shown under a single roof and despite hundreds of sessions, ample time for visiting the display booths has been provided.

There is still time for planning a visit to the largest safety convention on the national scene. While Chicago's hotels will be taxed to capacity, quarters can be found upon application to the sponsors, National Safety Council Housing Bureau, 425 North Michigan Avenue, Chicago 1, Illinois.

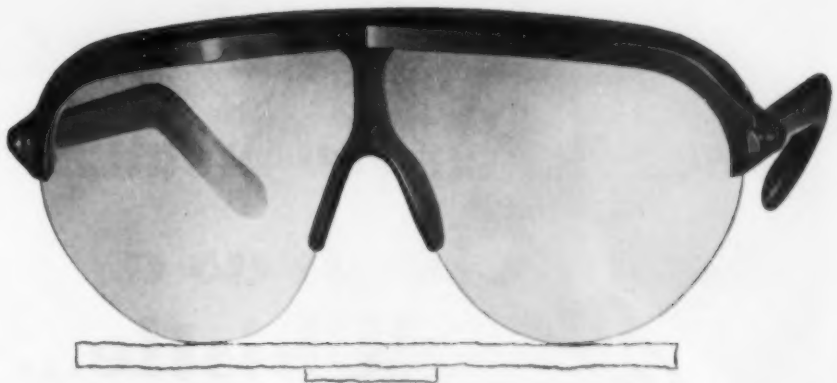
All lines of industry can lay claim to being busy. Nevertheless, it would seem that attendance at this convention would enable delegates and visitors to return to their respective communities better than ever equipped to cope with hazards to life and property.

For those concerned with traffic and transportation safety, special sessions will be held at Chicago's Congress Hotel where speakers of outstanding ability have been chosen to address the meetings.

Here is the year's outstanding opportunity to learn the last word in safety and maintenance developments as they affect the well-being of millions of our industrially employed. H.A.

"Vote As You Please—But Please Vote"

NEW FEATHERWEIGHT CHAMP



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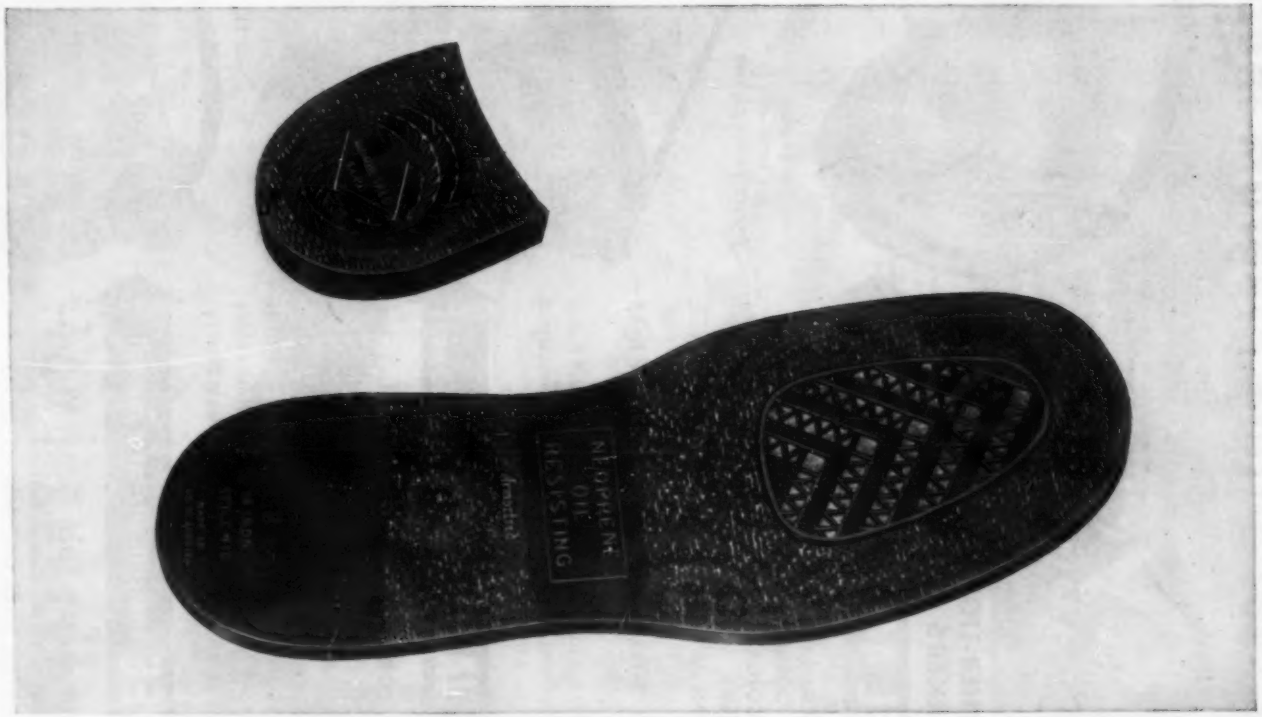

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Large size fits over all prescription glasses

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CLEAR OR GREEN lenses available.
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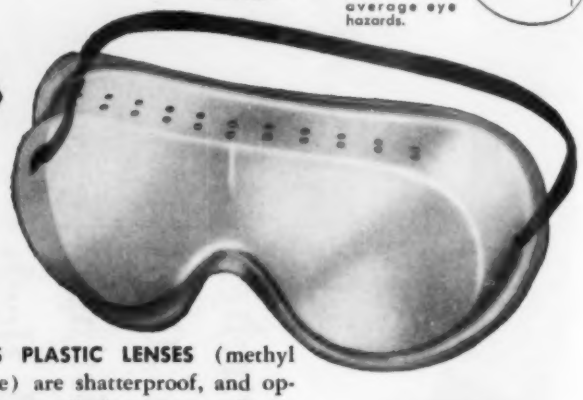

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When eye SAVERS stand guard!

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For the finest in eye protection, ask for Eye-Savers!

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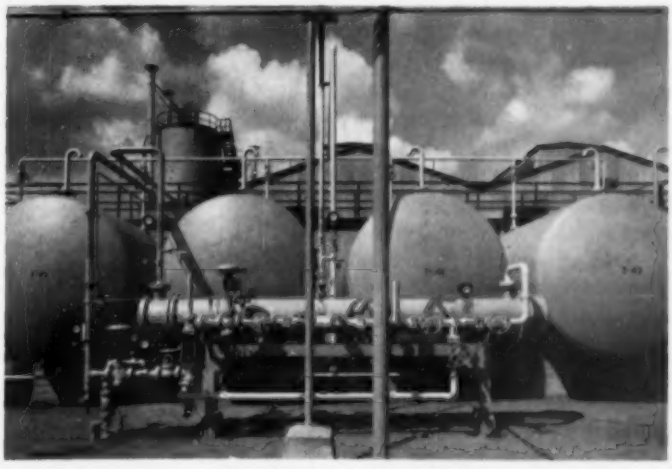
SAFETY MAINTENANCE & PRODUCTION
VOL. 104, No. 4 • OCTOBER, 1952

The Safety Engineer Rolls Up His Sleeves

What exactly are the responsibilities of the safety engineer? Here are some pointers on how to apply the principles of safety engineering—especially in the chemical industry.

By STANLEY F. SPENCE
Director, Safety & Fire Prevention
American Cyanamid Company
New York



The safety engineer must cooperate with the engineering department in the design of new processes or plants, such as this automatic ammonia dilution equipment, storage tanks and storage silo of a cracking catalyst plant in Indiana.

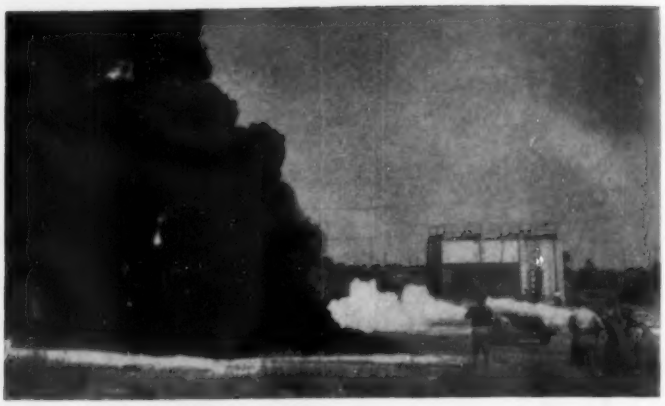
AS BACKGROUND for what follows on the application of safety engineering to industrial accident prevention, my own company's policy is that we cannot afford to operate an unsafe facility. We feel that a large number of accidents would be an unfavorable reflection upon our ability to design, to construct, to maintain, and to operate.

The safety engineer's job is simply a part of the total process of safety management. One of the favorite subjects for discussion in some quarters always has been how or why an engineer either makes the best safety director, or makes a poor safety director. If the subject is reviewed analytically in the light of the broad scope of industrial management, the problem follows the line of all professional and management placements and becomes adaptable to very reasonable and practical solution. The difficulty is that many who take active part in this controversy try to fasten specific and positively-evaluated qualifications on a job which varies widely, according to type of industry, plant or corporation size, and other variables.

The Safety Engineer as an Engineer

As far as engineering as such is concerned, the safety engineer has more in common with the project manager, or the engineering manager, than he has with the design engineer.

All engineers must have a fundamental understanding of the sciences. They then ordinarily specialize in one particular field—though this need not necessarily be a specialized field of design or construction. The *(To page 67)*



Two dry chemical wheeled extinguishers attack an 800-square-foot pit fire of benzol.

Chip blaze in an automatic machine is extinguished with one-quart unit utilizing pressurized CBM (chlorobromomethane).

THE ABC's OF FIRE

FIRE losses in the United States last year reached the all-time high of $731,405,000. American industry contributed more than $150,000,000 to the staggering national total.

In addition to the 32,000 industrial fires recorded by fire marshals and fire chiefs, numerous small "unreported" blazes break out during the course of a year. These are the blazes which are brought under control promptly by alert personnel armed with approved fire extinguishers. They do not show in the records, but each one of them could have caused substantial property damage and dollar loss if not extinguished when small.

Fire, which we see and use every day, remains something of a mystery to most of us. It can exist only when three elements—fuel, heat and oxygen—are present. Take any one of them away and fire will die out.

This knowledge is today the basis of modern, scientific fire fighting. All techniques of fire control are directed at the removal of one or more of the three fire producing essentials.

This can be done by cooling (temperature or heat control),

Class A fires: Wood, paper, cloth, rubbish and other combustible materials	**Use: approved foam, water or soda acid extinguishers.**
Class B fires. Oil, grease, paint and related products	**Use: approved foam, dry chemical, vaporizing liquid, carbon dioxide. (Do not throw water on this type fire; it spreads the flames.)**
Class C fires: Electrical installations, including motors and generators	**Use: approved carbon dioxide, dry chemical, vaporizing liquid extinguishers. (Do not use "water type" extinguishers on electrical fires.)**

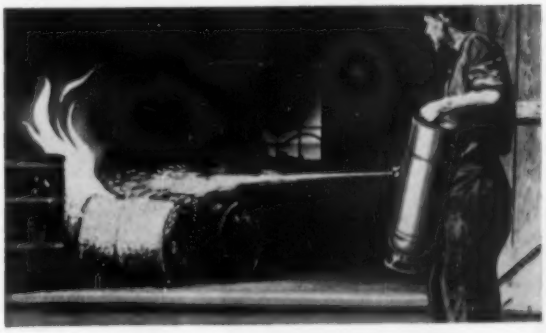
Dry chemical extinguishers are suitable for flammable liquid and electrical fires.

For what kinds of fires are the various extinguishers suitable? How do extinguishers operate and how should they be maintained?

For detailed descriptions of fire extinguishers see pages 24–50 of the 1952–53 Edition of "Best's Safety & Maintenance Directory"

EXTINGUISHERS

By PATRICIA C. HENSLER
Fire Protection Institute
New York City



Foam extinguishers smother fires in flammable liquids as well as in ordinary combustibles such as wood, paper, textiles, etc.

smothering (oxygen control) or isolation (fuel control). The extinguishing method to be used depends entirely upon what is burning.

For each of the three major classifications of fire ("A," "B," and "C") there are one or more types of extinguishers best suited for putting out the flames most efficiently. It pays to know your ABC's where fire control is concerned since failure to use the right type of extinguisher in fighting a blaze may prove fatal.

In selecting fire extinguishers to guard your premises, choose those bearing the seal of the Underwriters' Laboratories or the Factory Mutual Laboratories. These seals indicate that—with proper maintenance—the devices bearing such stamps of approval will perform satisfactorily when needed. Before an extinguisher is eligible for either label, it must meet rigid performance standards.

Before leaving the factory, all approved extinguishers have been subjected to tests and checks designed to assure their perfect operating condition. It is only when they reach the buyer that trouble sometimes develops because of imperfect maintenance, failure to refill an extinguisher after use, incorrect application due to lack of education in fire-fighting methods and the purchase of equipment too small for the hazards involved.

Like any other manufactured product, a fire extinguisher requires a certain amount of care to work at maximum efficiency at all times. Extinguishers should be checked carefully at regular intervals for such danger signs as corrosion or denting, which mean the extinguisher cannot be depended upon until the flaw is mended. The manufacturer's instructions on recharging also must be followed to the letter.

FEATURE

This is the second of a series of four feature article on Fire Protection. The next two articles will appear in the November & December issues of SAFETY MAINTENANCE & PRODUCTION.

Soda-Acid Extinguisher

This extinguisher, when inverted, mixes two chemicals. The chemicals add nothing to the extinguishing agent, which is water, but serve to furnish an expelling force sufficient to completely and accurately discharge the extinguisher's contents.

It is used to fight Class A fires. Since the stream discharge is primarily water, it is not recommended for use on flammable liquids or live electrical equipment. To use the extinguisher, invert and soak the burning material with the contents.

The soda-acid extinguisher must be recharged annually since age tends to deteriorate the chemical contents. When recharging, remove the ring top and acid bottle. Wash the interior parts of the extinguisher thoroughly and force clear water through the hose and nozzle. Use only those chemical recharges supplied by the manufacturer. Dissolve the bicarbonate of soda in water by stirring until completely dissolved. Then pour the solution into the extinguisher and add sufficient water to bring the

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See the AO Exhibit at Booths 79, 80 and 81 — National Safety Convention, Chicago, October 20 to 24.

(For further details, use the Reader's Inquiry Card on page 115)

solution level to the water mark located on the inside of the extinguisher.

When the extinguisher is assembled, a dab of vasoline or cup grease can be spread on the threads of the cap. The cap should be screwed on tight, making sure at least four complete threads are engaged. The date of recharging can then be registered on a tag attached to the extinguisher.

Pump Type Extinguisher

This extinguisher is frequently used for the same purpose as the soda-acid. It is filled with either plain water or water with an anti-freeze compound added, and is operated by a hand pump. It is suitable for use on Class A fires.

The extinguisher should be washed out with clear water, the shell examined both internally and externally for damage or corrosion and the pump tried out for proper operation. Apply a little light oil to the working parts and then fill to the proper level with clean water. If it is stationed where freezing may occur, add a calcium-chloride solution, making sure this solution contains an anti-corrosive agent.

Foam Extinguisher

This extinguisher puts out fire by shutting off the supply of oxygen. Thus, it is principally a smothering-type extinguisher although the water content of the foam has a cooling effect in addition. Foam extinguishers are recommended for use on Class A and B fires.

To use, invert the extinguisher and aim at the base of a wood fire or float on top of a liquid fire.

All recommendations made regarding the recharging and inspection of soda-acid extinguishers apply to foam extinguishers. Where "acid bottle and stopple" are mentioned, under soda-acid, simply substitute "inner cylinder and stopple" and follow the directions on recharge packages.

Carbon Dioxide Extinguisher

The carbon dioxide extinguisher, which discharges a cold white cloud of CO_2 to displace the oxygen in the air and smother the fire, is particularly suited for use on Class B and C fires. The gas does not damage machinery, materials or finishes. To use, unhook the hose, pull out the lock pin and either squeeze the trigger or turn the hand wheel. Discharge at the base of the fire.

While it is not necessary to recharge these extinguishers periodically, their weight should be checked regularly in order to detect leakage or accidental discharge. It is vital that the manufacturer's weight specifications, stamped on the extinguishers, be adhered to strictly. If the extinguisher shows a net loss of weight exceeding 10 per cent, it must be recharged. Units to be recharged can be filled at the manufacturer's plant or by jobbers or agents handling carbon dioxide.

Vaporizing Liquid Extinguisher

These extinguishers, which contain carbon tetrachloride or CBM (chlorobromomethane) as the special extinguishing agent, are especially useful on Class B and C fires. To apply, turn handle and pump. Direct stream on the fire. The gas is heavier than air, so it surrounds the fire, excludes the oxygen and kills the blaze.

Once a year the carbon tetrachloride extinguisher should be partially discharged into a clean dry glass receptacle to test operation of the pump and nozzle opening. The liquid can then be returned to the extinguisher, making sure it is kept full to within one-half inch of the filler opening at all times. The filler cap must be screwed on tightly.

Commercial carbon tetrachloride should not be used for recharging the vaporizing liquid extinguisher, as the commercial grade generally sold may contain impurities which may harm the device. Water should never be brought into contact with this type of extinguishing agent. Although there may be no direct or immediate reaction between water and the vaporizing liquid, hydrolysis does take place over a period of time with the formation of hydrochloric acid. This acid, in turn, may cause serious corrosion of the working parts of the extinguisher.

Dry Chemical Extinguisher

Another extinguisher which uses the oxygen control method is the dry chemical. It discharges a chemical powder which generates CO_2 gas in the presence of heat, thus lowering the oxygen concentration. It is recommended *(To page 81)*

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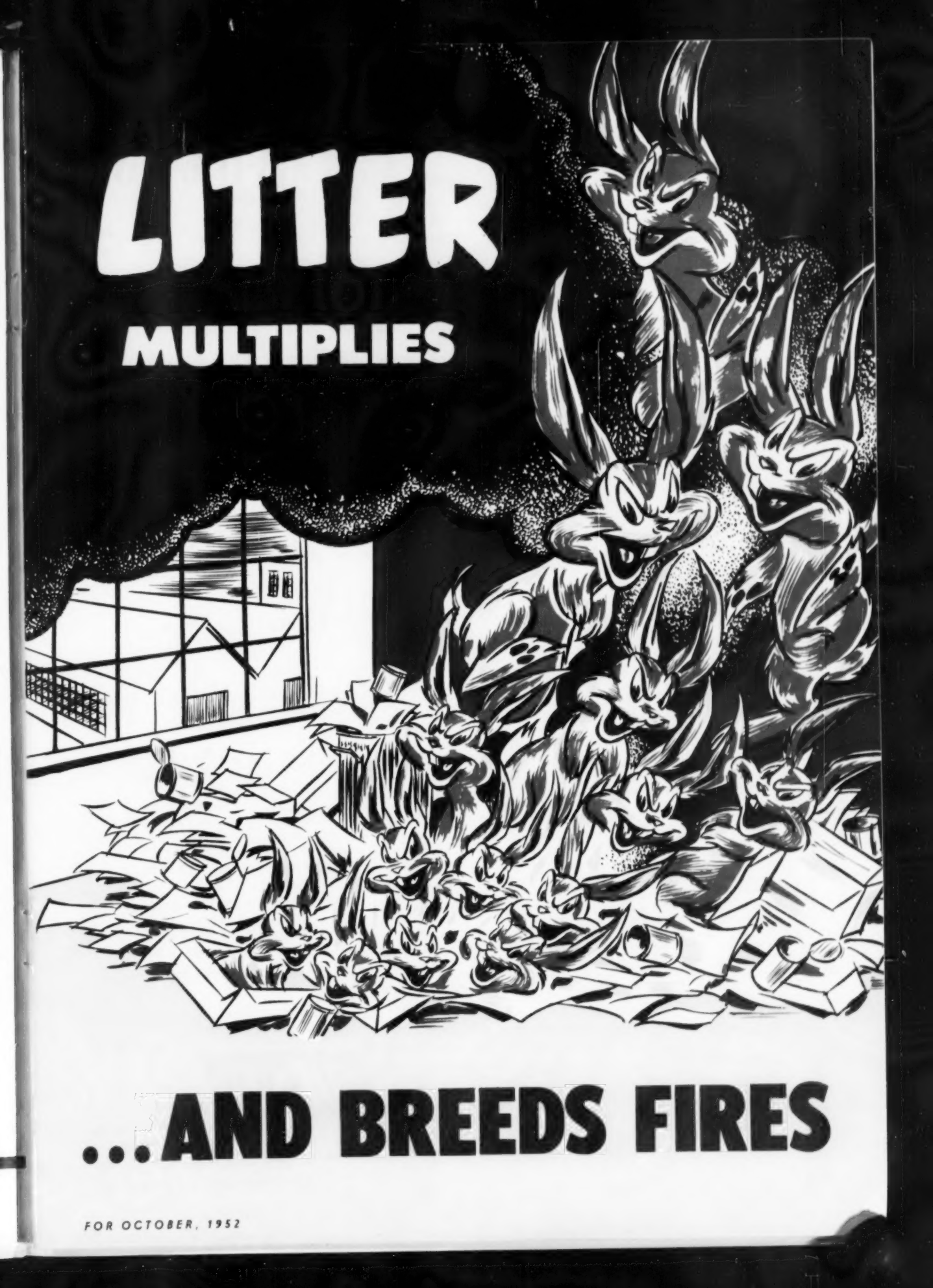
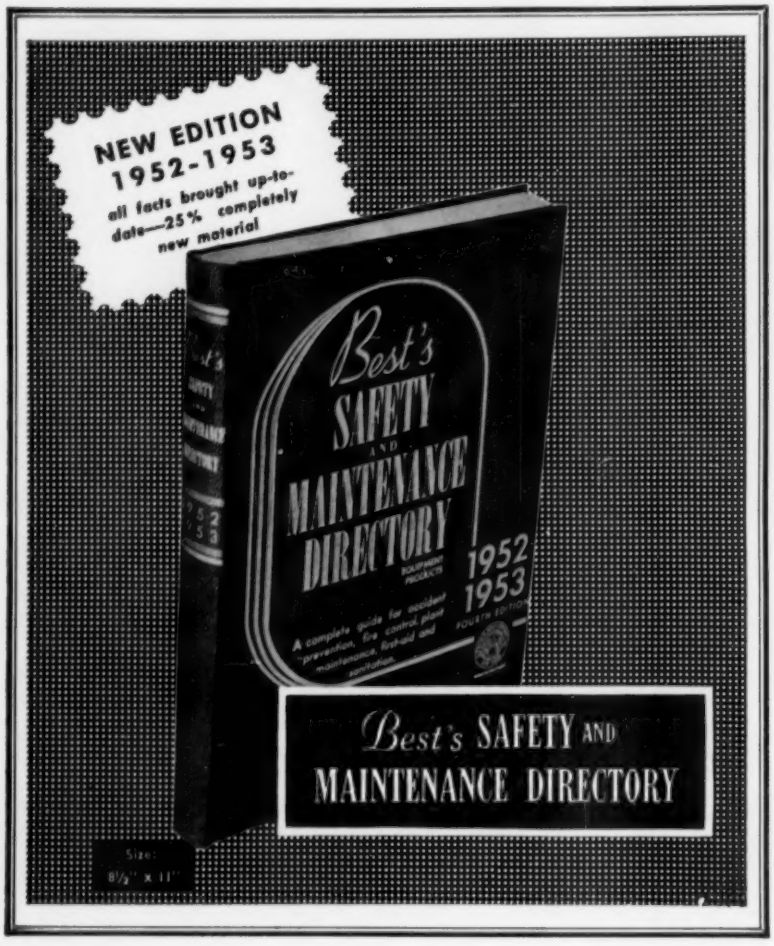


FOR OCTOBER, 1952

DOUBLE DUTY ANSWERS



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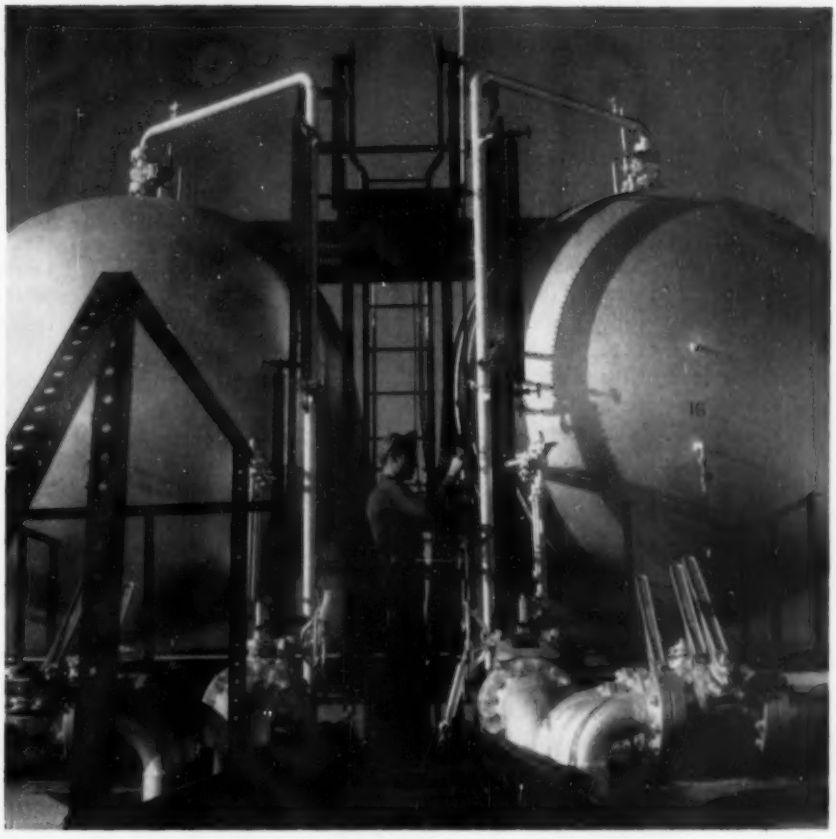

Storage tanks for liquefied petroleum gas.

How to Store and Use Liquefied Petroleum Gas . . . Safely

If liquefied petroleum gases are to be transported and used with the utmost safety, sound engineering principles must be incorporated in the storage and handling equipment.

By
ELMER O. MATTOCKS, Asst. Director
Department of Technical Services
American Petroleum Institute

PART 2

(Continued from the September issue of "Safety Maintenance & Production")

LIQUEFIED petroleum gas is used in domestic and commercial installations in a manner similar to that for utility gas. These installations are primarily for cooking, refrigeration, water heating, and space heating. Domestic installations are furnished LPG to a great extent from ICC cylinders. A large number of domestic installations however utilize permanently installed containers up to a 1,000 gallon water capacity. The storage capacity in rural areas may occasionally exceed this amount. However, in such cases fuel is used also for other purposes such as tractors, flame weeding, alfalfa drying, operation of irrigation pumps and the like. The liquefied petroleum gas industry has been very strong in recommending wherever possible the use of only AGA approved gas consuming appliances.

The problems involving domestic installation may be divided into two distinct groups, namely, the storage of LPG, and the piping of the gas to the gas consuming appliances. The basic principles which have been set forth previously in this discussion for the storage of LPG applies to domestic installations. The ICC cylinder must meet the construction specifications and requirements of the Interstate Com-

merce Commission. Other containers must meet the construction requirements of the ASME or the API-ASME Unfired Pressure Vessel Code or the code of the locality in which the container is to be installed.

The piping requirements for conducting the gas from the storage container to the gas consuming equipment are in general the same as for any other utility gases. It is necessary however to use special pipe dopes, regulator diaphragms, and packing materials which are resistant to LPG. It is necessary, of course, that the gas consuming appliances be equipped for use with LPG.

The industrial use of LPG may be slightly different from the use of utility gas. In the case of domestic and commercial installations, the gas is usually piped from the top of the storage container to the gas consuming appliance. At far as the consumer is concerned his system is entirely one containing gas although the storage containers will hold liquid. The use of gas is such that it is replaced by liquid being vaporized from the container. The heat of vaporization which is necessary to convert liquid LPG into gaseous LPG is obtained from any one or all of the following sources: the liquid within the container, the container itself, and the air surrounding the container.

Extra Precautions

Currently, a great deal of discussion is going on relative to the need for additional safeguards with LPG containers. In NFPA Pamphlet No. 58 it is indicated that in industrial installations involving containers of 150,000 gallons aggregate capacity or more where serious mutual exposures between containers and adjacent property prevail, the authority having jurisdiction may require fire walls designed and constructed in accordance with good engineering practice. This would indicate that five 30,000 gallon containers may be the maximum number of containers that may be installed without consideration of additional precautions. On the other hand, the NFPA Pamphlet No. 59 for LPG utility gas plants provides that when the number of containers exceeds 10, they shall be segregated into groups not exceeding 10 and each group shall be separated from each other by at least 25 feet.

Proper provisions should be made in the case of large installations for locating water hydrants at strategic points. While there is no exact method of determining this requirement, general fire engineering ideas should prevail. The hydrants should be so located that they will be accessible in case of a fire. This will require generally that they be located not closer than 25 to 50 feet to the nearest container.

At each hydrant location there should be a hose cart with sufficient hose to permit placing water if necessary on the far end of the tanks in the immediate vicinity. The hose should be equipped with a combination fog nozzle or its equivalent. Likewise, the hose cart should be protected from weather by a suitable housing.

Insulation of Containers

The insulation of LPG containers so that the rate of heat transfer to the container contents is reduced is an important consideration. The use of applied insulation to above-ground containers has some definite limitations. The insulation must be waterproofed in order to eliminate the possibility of water getting into the insulation and freezing either due to the low temperature of the container contents or low ambient temperatures.

Perhaps the most effective way of insulating a tank is to bury it. Some installations have been made in which they have been half buried with the upper half of the tanks mounded with earth removed from the excavation.

Depressuring Valves

Relief valves installed on an LPG container are designed to keep the pressure in the tank from exceeding a predetermined amount. As long as the metal temperature of the tank does not go above a certain temperature, which is dependent upon the type of metal used in the construction of the container, the tank would not be expected to fail. However, if a tank is enveloped in a fire for an appreciable period of time the metal, especially in the vapor space, may approach or exceed this critical temperature. When this occurs the strength of the metal becomes insufficient to hold the pressure in the tank which is maintained by the relief valves and rupture occurs generally. To forestall such action a de-

(Continued on page 30)

Railroad tank cars being loaded with LPG from storage drums.

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VANO DESIGN "B" VENTILATOR here discharges welding fumes from double-bottom compartment in naval vessel under construction. Large volume of air handled quickly expels fumes and results in good ventilation. Vano Design "B" can pass through opening only 14" in diameter. Uses 8" diameter flexible canvas tubing ("Ventube").

VANO DESIGN "C" VENTILATOR here withdraws fumes from a reactor kettle. This ventilator can be furnished with 8" suction inlet for 8" non-collapsible suction tubing — or multiple inlet nozzles for 5", 4", and 3" suction hose. The discharge may be connected to 8" "Ventube." Capacities furnished on request.

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PORTAIR NO. 4 BLOWER EXHAUSTER exhausts fumes resulting from soldering, welding, tank coating, is also used in ventilating small tanks. It is designed to permit attachment of 4" flexible metal hose. Capacity: 425 CFM free air.

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(For further details, use the Reader's Inquiry Card on page 115)

pressuring value has been developed. The valve, which is similar to a pilot operated valve, is actuated by the melting of a fuse plug located in a piping system which is part of the valve bleed system. The resultant loss of pressure from gases escaping through the melted fuse plug opening causes the depressuring valve to open and reduce the container pressure to atmospheric pressure. Fuse plugs can be placed as close together as thought necessary and at any place on the tank desired.

Value of Dikes and Barriers Questioned

Liquefied petroleum gas, although stored as a liquid, should be considered from the safety standpoint primarily as a gas. While it is possible to envision how liquid LPG might flow under certain conditions of tank failure, under practically all such conditions sufficient heat is available from the surroundings to vaporize the liquid to gas almost immediately. Under such conditions, dikes which are used to retain flammable liquids would be of little use unless they were employed to divert the flow of gas. Such use is of questionable value. Actually dikes may create a hazardous condition which might not be present if no dikes were used. The free circulation of air around LPG containers is highly desirable so as to dilute with air any escaping LPG.

Barrier walls are advocated by some insurance and regulatory people as additional protective means. They are generally interposed between the tanks and a potential hazard such as moving traffic, buildings and the like. The use of barrier walls should be studied carefully from the possibility of restricting air movement around containers. Such restriction may actually create a hazard by restricting any leaking gas from being diluted readily with moving air currents. Likewise, the possibility of the barrier wall being moved forcefully in the case of an explosion within the storage area should be examined. Under some conditions barrier walls may appear to give additional protection. It is highly questionable, however, if they can give other than superficial protection.

Experience has demonstrated clearly that liquefied petroleum gases may be transported, stored, and used with utmost safety if sound engineering principles are employed in the design, construction, and operation of the equipment required to handle this material. While isolated cases of failure have occurred, it has been possible in practically every case to show that the failure was due to improper engineering.

Picture credits: Page 27—Cities Service Co.; Page 28—Standard Oil Co. (N. J.)

Health Center Offers Free Safety Materials

TO SPUR interest in industrial safety, the Astoria Health Center in Astoria, N. Y. is currently sponsoring a program designed to initiate or supplement existing programs. Without cost of any sort, those interested may have films shown to their employees, have someone discuss safety methods and procedures to key personnel, and/or under the supervision of a health educator conduct and organize a safety program within the company.

Following are the films which may be borrowed on three weeks' notice:

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LIFTING

TARGET USA—(A Civil Defense film illustrating how an industrial plant may best protect itself in time of emergency)

The above films are owned outright by the Department of Health. Other films may also be had on a gratuitous basis.

For further information, write to: Mr. David Miller, Health Educator, Astoria Health Center, 12–26 31st Avenue, Astoria, New York.

Eye Preservation

IN HIS annual report to some 1000 members and guests of the Illuminating Engineering Society assembled at the Edgewater Beach Hotel, President S. G. Hibben stressed the need for directing more Society activity towards the care and preservation of human eyesight. Urging an expansion of membership to strengthen the Society influence, Mr. Hibben commented on the increased burdens placed upon the seeing organs in a civilization that uses vision with an increasing tempo

"It is a red flag of warning to note that one school child out of six cannot naturally see well enough to learn properly and that more or less as a result of faulty vision, our school children suffer some 85,000 eye mishaps a year. It is challenging to note that more than 20 per cent of the young men of this nation called for military duty cannot, without 'eye-crutches,' see well enough to fire a rifle or read an instrument or to observe a night signal!"

In emphasizing the importance of Research for the procurement of fundamental lighting knowledge President Hibben stated, "We still have much to study, much to digest and appraise, much to search out, beginning with the physiological functions of seeing and carrying through to the research work on better instruments, more perfect sources of radiation, better coordination, the logic of specific applications, and undoubtedly better methods of teaching."

The technical committee program was mentioned by President Hibben as the backbone of strength of the Society's output. "More than one thousand members (one out of seven) give of their time and counsel to our seventy-one committees! It is impossible to place too much emphasis upon the value of output of these Committees because where else in the nation and from what other sources could we obtain our guides for lighting practice, or for our fundamental facts to be incorporated into national standards, or even in our laws?"

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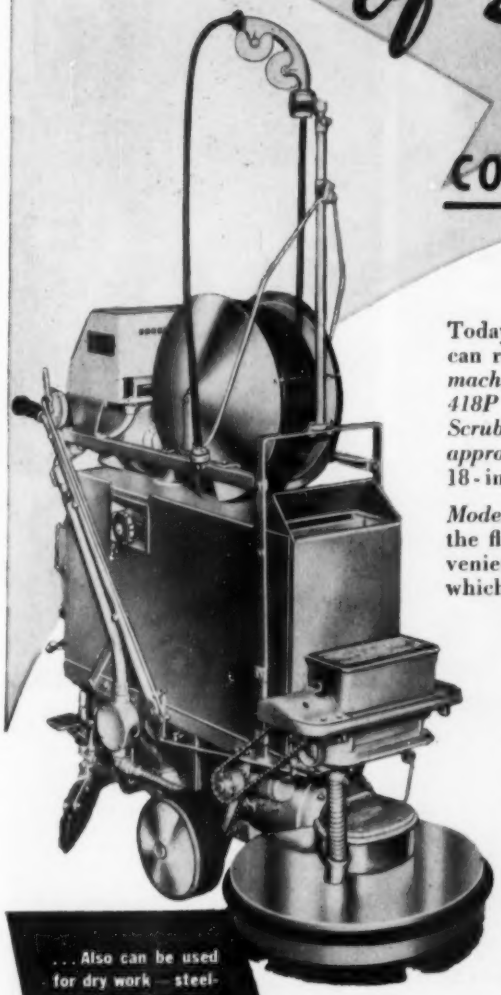
WITH A

COMBINATION SCRUBBER-VAC!



...Also can be used for dry work — steel-wooling, et cetera

Today, even buildings with but 2,000 to 15,000 sq. ft. of floor space can reap the labor-saving, cost-reducing benefits of *combination-machine-scrubbing.* Here's a *Combination Scrubber-Vac, Model 418P* at left, that's specially designed for such buildings. This *Scrubber-Vac,* which has an 18-inch brush ring, cleans floors in *approximately one-third the time* required with a conventional 18-inch machine and separate vac unit.

Model 418P applies the cleanser, scrubs, and picks up (damp-dries the floor) — *all in one operation!* Maintenance men like the convenience of working with this single unit... the thoroughness with which it cleans... and the features that make the machine simple to operate. It's *self-propelled,* and has a *positive* clutch. There are no switches to set for *fast* or *slow*—slight pressure of the hand on clutch lever adjusts speed to desired rate. The powerful vac performs efficiently and quietly. (Powder dispenser is optional.) Compactly built, the *418P* also serves advantageously in larger buildings for the care of floors in narrow aisles and congested areas.

Finnell makes *Scrubber-Vac Machines* for small, vast, and intermediate operations, and in *self-powered* as well as *electric* models. From this complete line, you can choose the size and model that's exactly right for *your* job (no need to *over-buy* or *under-buy*). It's also good to know that you can lease or purchase a *Scrubber-Vac,* and that *there's a Finnell man nearby* to help train your maintenance operators in the proper use of the machine and to make periodic check-ups. For demonstration, consultation, or literature, phone or write nearest *Finnell Branch* or Finnell System, Inc., 4110 East Street, Elkhart, Indiana. Branch Offices in all principal cities of the United States and Canada.

Conserve Manpower with Completely Mechanized Scrubbing

FINNELL SYSTEM, INC.

Originators of Power Scrubbing and Polishing Machines

Everything for Floor Care — FINNELL

BRANCHES IN ALL PRINCIPAL CITIES

(For further details, use the Reader's Inquiry Card on page 115)

This is the third of three feature articles on Above-Ground Safety. The first two articles, dealing with ladders and high-level work, appeared respectively in the August and September issues of

MODERN SCAFFOLDING—

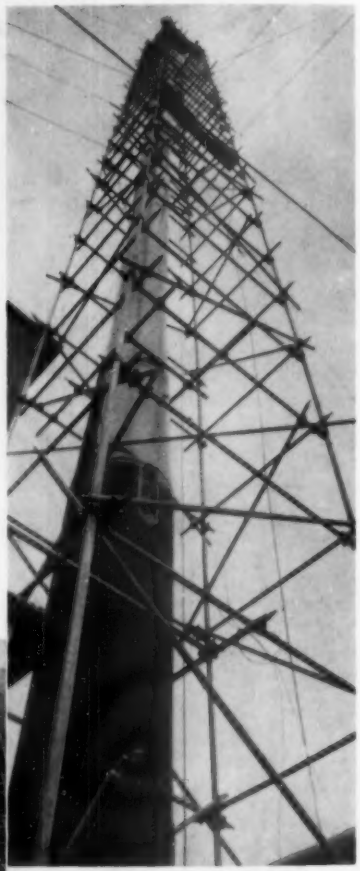
HIGHROAD TO SAFETY

Efficient metal scaffolding speeds work and cuts costs while providing maximum safety for the worker.

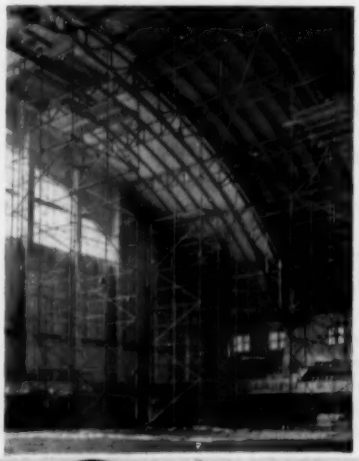
MODERN, metal scaffolding, an important factor in today's safety practice, pays multiple benefits where off-the-ground work is done: It is far safer than the untested, makeshift wooden scaffolding it replaces, contributing markedly to good safety records; it increases worker efficiency by permitting properly supported, free-moving, confident workers to do their tasks rapidly and properly; portable, adaptable, durable and neat, it is erected easily and rapidly, permitting workers to spend more time at their jobs, less time getting ready to start.

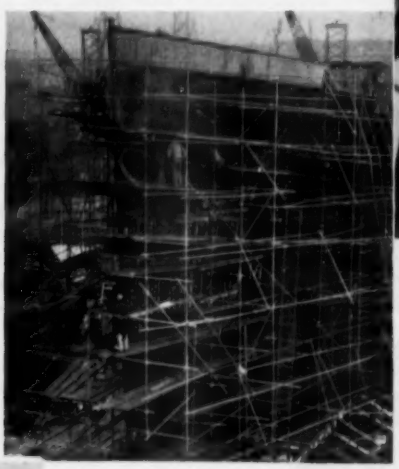
The photos on these pages illustrate various types of metal scaffolds, their safety features and some of their uses.

Photos courtesy The Patent Scaffolding Co., Inc., Long Island City, N. Y.



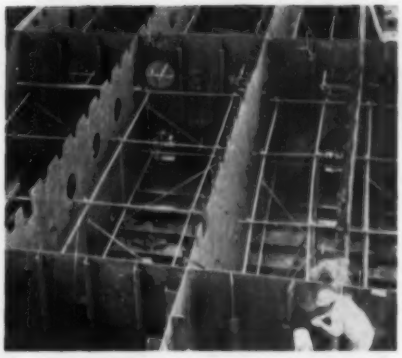
TUBE-AND-COUPLER SCAFFOLDING is recommended for use where extreme heights must be reached and difficult contours followed. It is available in steel or aluminum, and features great strength and rigidity for maximum safety in its intended uses. Photo, above, illustrates how this type scaffolding is built up for safe, high platforms during stack maintenance. Photo, above left, shows how it was erected to follow the curves of a ship's hull. Note that many men are able to work at different levels from deck to bottom.



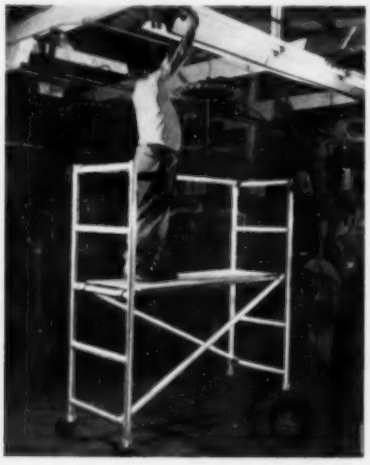


MOVABLE PLATFORMS may be made by equipping tube-and-coupler type scaffolding with casters so that the complete scaffold may be rolled easily to a new position as required. This avoids frequent dismantling and erection of scaffolding on one job, and permits the use of a minimum amount of equipment. Photo, left above, shows rolling scaffolds set up for maintenance work on a high, curved ceiling. Note how entire area can be covered by moving a relatively small scaffolding installation. Photo, left, shows a rolling scaffold erected so that welders may work all the way around a large vehicular tunnel tube.

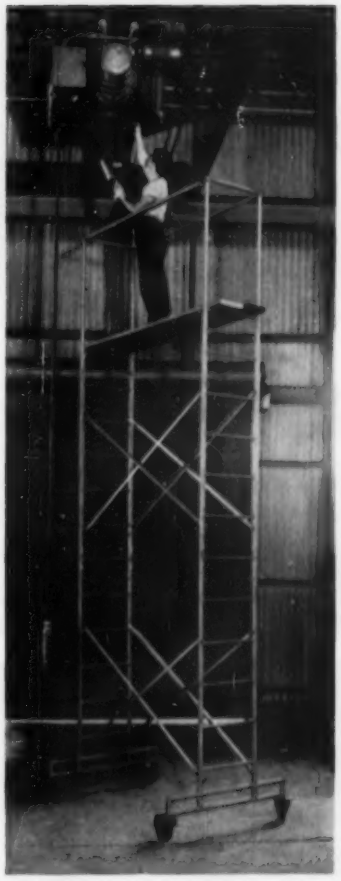
For detailed descriptions of scaffolding equipment, see pages 392–399 of "Best's Safety & Maintenance Directory" 1952–1953 Edition.



VERSATILE tube-and-coupler type scaffolding finds many unconventional uses. In photo, left, it is assembled to form racks for metal stock. This is storage with absolute safety because heavy stock cannot slip or fall out to cause injury. Photo right: safe, fireproof steel tube-and-coupler scaffolding was erected to make work platforms during the welding of deck plates on a barge. An interesting point is that after work was completed, all scaffolding was removed through a small hole in the deck.

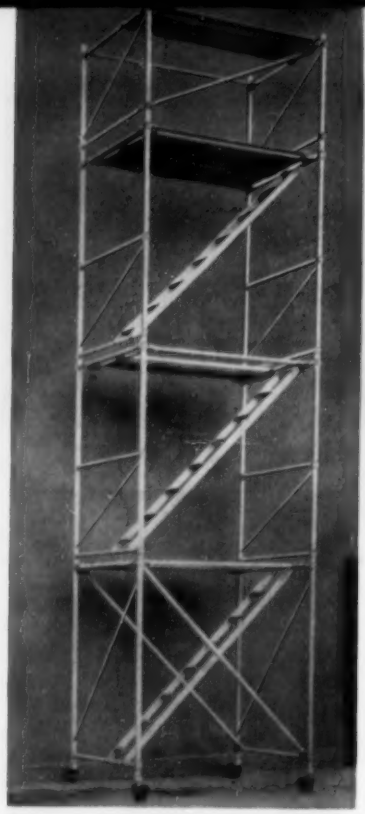


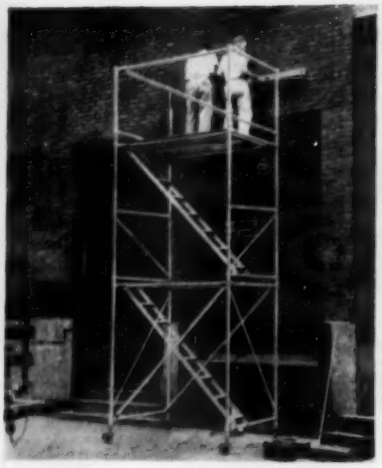
LADDER SCAFFOLDS are light-weight, strong and extremely useful for safe maintenance work in plants and buildings where portability and one-man erection and use are desired. Caster-equipped, ladder-type end frames are joined by horizontal and diagonal cross bracing to form a sturdy scaffold for low-to-medium height work. Illustration, left above, shows single section of aluminum ladder scaffold (UL approved). Note that guard rail and locking casters are used for maximum safety. Photo, right above, shows another aluminum ladder scaffold being used for replacing fluorescent lamps.

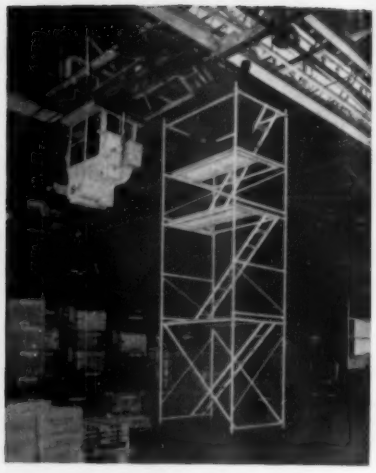


SECTIONAL STEEL LADDER SCAFFOLD (UL approved) is being used for hoist maintenance. Notice the extension bases used to increase the base area for safety at greater working heights. These rapidly erected scaffolds form a compact package for space-saving storage when dismantled.

SECTIONAL STEEL SCAFFOLDS are made up of prefabricated steel frames that are tied together rigidly with adjustable cross braces. They may be assembled to provide a working platform of almost any desired size. Adjustable legs permit levelling on sloping surfaces, and sections of varied heights permit exact erection to desired working levels. Photo, left, shows sectional steel scaffold (UL approved) as installed to permit safe, rapid finishing operations on a barge.







ROLLING SCAFFOLDS made up of prefabricated aluminum sections are very useful for safe worker support in industrial and building maintenance, remodeling and decorating. The aluminum rolling scaffolds are light in weight and easy to erect. Photo at left shows an aluminum rolling scaffold (UL approved), three and one half sections high. Note the internal stair for safe climbing. Photos left and right, above, illustrate how working platforms may be placed at top of a full section or at the intermediate level. Note also the use of safety guard rails and locking casters.

FOLDING SCAFFOLD (UL approved), an innovation in aluminum rolling scaffolds, is shown in photo, right below. Each section is prefabricated as a folding unit that can be easily and rapidly erected or dismantled. Because the scaffold unfolds like a book standing on end, it can be set up by one man standing within the base area, without danger of the members "folding over" or collapsing. Assembled here are a base section, full intermediate section and a guard rail section. Maximum safety is assured by sound design and high-strength, durable construction.

SWINGING SCAFFOLDS are preferred for many jobs. For greatest safety, these mechanical swinging scaffolds are suspended by steel wire rope and should have positive-locking devices for raising and lowering, as shown in the photos above. Top above: a small swinging scaffold that is recommended for light-duty work. Note how the wire rope winds onto a gear-powered drum for safe, easy raising and lowering. Bottom above: a swinging scaffold (UL approved) for medium-duty service. Here the drum is powered by a ratchet-raising mechanism for speed with safety, and smooth lowering is provided by a worm and gear mechanism. Locking pawls hold the scaffold in position while men are working. Note safety guard rails and toe boards on both scaffolds.

SELLSTROM *Quality Eye and Face* SAFEGUARDS

Published by Sellstrom Manufacturing Company 656 No. Aberdeen St., Chicago 22, Ill.

THESE MIRACLE WELDING GOGGLES CAN PAY FOR THEMSELVES IN A SINGLE DAY

NO. 420

Here are the No. 420 Sellstrom Welding Goggles which practically do away with one of the greatest of welding goggle problems. Each eye cup has eight magical light-proof, anti-fogging ½ inch air ducts. This positive ventilating system furnishes such an abundance of air ventilation that it reduces fogging to an almost vanishing point.

This single feature can sometimes so greatly increase welding efficiency that the added protection can sufficiently lower the welding cost to permit the goggles to actually pay for themselves by a single day's use. The inner lens rings are both notched and cemented to doubly guard against breakage. The firm even pressure on the lens greatly reduces lens breakage.

The frame is moulded from rugged plastic. All edges are carefully rounded to assure maximum comfort. A covered stainless steel ball-chain nose bridge can be adjusted to 1/1000th inch for a perfect fit. Weight, including lenses, 3½ ounces.

If you are not already furnishing these outstanding welding goggles to your welders, please write for a special folder which completely illustrates and describes the many outstanding features of the amazingly efficient No. 420 Sellstrom Welding Goggles.

OFFERING 111 NEWLY DESIGNED DEPENDON INDUSTRIAL SHIELDS

The original Sellstrom Dependon Shield was designed for sports use: Ice Boating, Motorcycling, Bob-Sledding, Skiing, etc., but industry quickly adopted these shields for their own use.

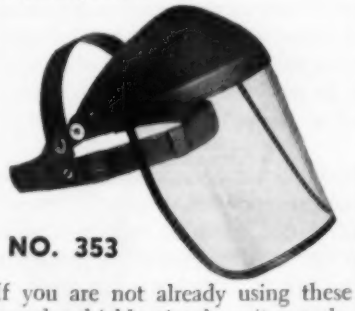
Now, after years of research and planning, Sellstrom offers Industrial Dependon Face Shields in 16 different styles, with a variety of window sizes for each shield, or a total of 111 different shields.

The illustration shows the No. 353 Shield. Headgear is made of vulcoid and fibre with elastic headband and buckle to assure easy, comfortable fit. It is adjustable to fit any head and is complete with sweat band. Interchangeable windows.

The double fibre caps shown in the illustration can be folded into each other or extended toward the top of the head when this protection is desired. A special swivel adjustment permits the window to be worn high, low, close or away from the face. The No. 352, not illustrated, is exactly like the illustration except that it has only a single cap.

There is no fire hazard. The acetate window is slow-burning and will not maintain its own combustion.

Dependon Shields are light weight, fit perfectly, allow air circulation in abundance, offer full wide vision and can be worn over prescription glasses. They are used in chemical plants, in foundries for pouring metal, in machine shops for grinding, chipping and wherever the face requires protection.



NO. 353

If you are not already using these popular shields, simply write us, describing your face hazards. We can then recommend the proper shield or shields. We will gladly furnish the name of a nearby dealer handling the shields best suited for your particular face hazards.

THIS HELMET SHOUTS COMFORT— SATISFACTION

NO. 243

This is one of America's outstanding welding helmets. It renders unusual service, is extremely comfortable, has long life because it is designed right, made right, wears right and offers an abundance of air circulation.

The hood is perfectly balanced. A specially designed vulcoid headgear with genuine top grain hatter's leather forehead cushion, held in place by snap fasteners, is a powerful reason for added comfort.

The helmet is of rounded one-piece construction of tough fibre. Can be quickly adjusted to fit any head. Front is held in any position by adjustable tension springs. Can be furnished with either of the three Sellstrom headgears. Front changing lens retainer if desired.

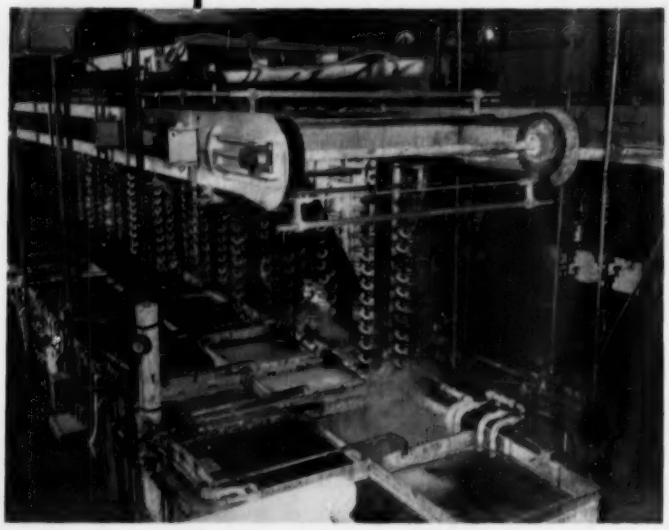
If you are not already using this helmet, we urge you to order at least one of them for test purposes. Simply write us for a sample helmet on memo for test purposes. Also let us furnish you with the name of a nearby dealer who can supply this popular No. 243 Sellstrom Welding Helmet.

EXTRA! **Be sure to see these and other items at our Booth No. 30 at the Chicago Hilton Hotel during the 1952 National Safety Show, October 20th through 24th.**

(For further details, use the Reader's Inquiry Card on page 115)

AIR CONTROL IN

Safety precautions in handling plating wastes include the control of dusts, fumes and vapors from the processes as well as the disposal of plating solutions.



View of modern, automatic cleaning and plating set-up.

By HENRY HARRISON
Research Chemist
Oakite Products, Inc.
New York City

CREDIT in very large measure is due to those engaged in the important electroplating division of American industry for their excellent safety record. The very nature of this work, and the exacting standards which must be met, rule out the careless and slipshod workers. Whether it is the superintendent, the foreman, the supervising technician sometimes referred to as the plater, or any of the people working on the polishing lathes, tanks and racks, in general they can be depended upon to be familiar with what they are handling, and to do everything necessary to protect themselves, their fellow workers, and the property of their employers.

There is perhaps no other branch of industry in which so many chemicals used are regarded as toxic. The term, "toxic," by the way, is one which is used here with some reluctance because its meaning is so indefinite when the word is applied to a particular substance.

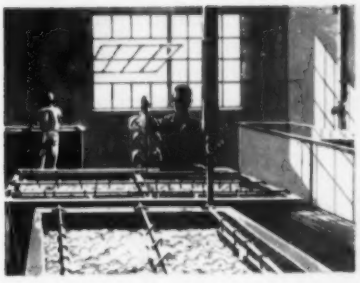
Nevertheless, when we are concerned with the activities of an establishment or a department working with highly corrosive acids; an assortment of salts of copper, tin, cadmium, nickel, zinc, etc.; organic solvents; alkalies; cyanides; and a miscellany of poisonous organic and inorganic salts, the word "toxic" will have to be employed from time to time.

Waste is defined as that which is thrown away as worthless after being used or spent; lost or unused during a process as by spoiling, leakage, etc.; thrown away or aside after being produced as defective or used in excess of the needed or usable quantity; allowed to escape unused as not needed; useless refuse, as, a waste product; waste water, steam, etc. Accordingly the wastes in connection with electroplating will consist of:

1. Dusts, and flying particles from grinding, polishing and buffing wheels.
2. Vapors and fumes from solvent pre-cleaners.
3. Contaminated and spent solvent dips.
4. Leakages and sludges from vapor degreasers.
5. Splashings from alkaline cleaning and solutions.
6. Hydrogen gas and spray from alkaline solutions used in electrocleaning.
7. Spent alkaline cleaning baths.
8. Fumes from bright dips.
9. Spent acids used in bright dips.
10. Fumes from solutions used for plating and anodizing.
11. Spent plating solutions.
12. Rinse waters used in connection with solvent pre-cleaning, alkaline cleaning, dipping, plating, and anodizing.

In handling and disposing of these wastes so that there will be no injury or harm to workers or property, good housekeeping and constant attention to personal hygiene are essential at all times in every section

ELECTROPLATING



A blanket of foam on alkaline solution prevents dangerous spray in electrocleaning.

For detailed descriptions of air control equipment, see pages 400–419 of the 1952–1953 Edition of: "Best's Safety & Maintenance Directory"

of a plating establishment or department. The supervisors and workers must always bear in mind that constant use of dangerous chemicals without accidents often creates an attitude of disrespect for the hazards involved.

In the plating shop, as in the home or elsewhere, there are three common entries for toxic substances into the human body: swallowing, inhalation, and adsorption through the skin. Needless to state, first-aid procedures should always be readily available for accidental swallowing, exposure to poisonous and corrosive fumes, spillage or splashing.

Attention to personal hygiene will provide against accidental swallowing of cyanide and poisonous metallic salts. The workers on the tanks holding cyanide solutions should wear rubber gloves, and when they leave the tanks they should wash their hands thoroughly. The practice of drinking from a rubber hose or from any water connection other than a regular drinking fountain should be discouraged.

Dust & Fume Control

Good ventilation and an efficient system of exhausting dust and fumes will go far toward eliminating any possibility of accidents and injuries due to inhalation.

In most states and cities, regulations have been established governing venting of fumes and dusts. Health departments conduct spot checks of air contamination. In some cases forced ventilation is optional; in others it is a necessity. The development of modern high speed, high temperature plating baths, which give off irritating and corrosive fumes, has made necessary the installation of ventilation systems for the protection not only of the workers, but also of valuable equipment and of the work being plated.

The dust and abrasive particles from grinding, polishing and buffing wheels are provided for by efficient dust collection systems connected with every wheel. Goggles or faceshields are worn to serve as protection against flying particles.

In special cases, dust respirators may be worn to remove harmful dust or mist particles from the inhaled air. If necessary, an industrial gas mask may be worn.

For protection of the skin against contact with solvents and acids used in plating operations, protective gloves, aprons and boots of synthetic or natural rubber should be worn. Protective creams or ointments are frequently effective against skin irritants.

Exhaust Systems

Solvent dips and bright acid dips are placed under hoods equipped with adequate exhaust systems. The bright dip, which usually consists of a mixture of concentrated nitric and sulfuric acids, occasionally with a small quantity of muriatic acid, requires an efficient hood. The fumes arising from a bright dip are oxides of nitrogen and there is one case report of a fatality arising from exposure of a workman to such fumes. In this particular instance, a firm had just moved into new quarters and no ventilation had been installed for the bright dip. The workman wore no mask. About 10 hours following a comparatively limited exposure to the fumes, the man was hospitalized, and after 18 days, died. Comment by the attending physicians was: "The history, physical signs and symptoms, and laboratory and X-ray findings made the diagnosis of 'nitric acid fume pneumonia.' Careful industrial precautions in the form of masks and exhaust systems installed in every possible occupation in which nitric acid fumes may appear, are the greatest factors in saving lives."

Foaming agents have been designed which may be added in small quantities to the acids to reduce the fumes from the acid dips. When copper alloys and brass are bright dipped in nitric-sulfuric acids, or cast aluminum is dipped in nitric-hydrofluoric acids, dense foam blankets are formed on the surfaces of the acids, materially reducing the escape of nitrogen oxide fumes.

Vapor Degreasers

The vapor degreaser is in wide use for removing oils and greases from metal parts prior to alkaline cleaning. Trichlorethylene and perchlorethylene, non-flammable and non-explosive organic solvents, are used in specially-designed equipment.

FEATURE

This is the first of three feature articles concerned with Dust & Fume Control. The next two articles of the series will be published in the November & December issues of SAFETY MAINTENANCE & PRODUCTION.

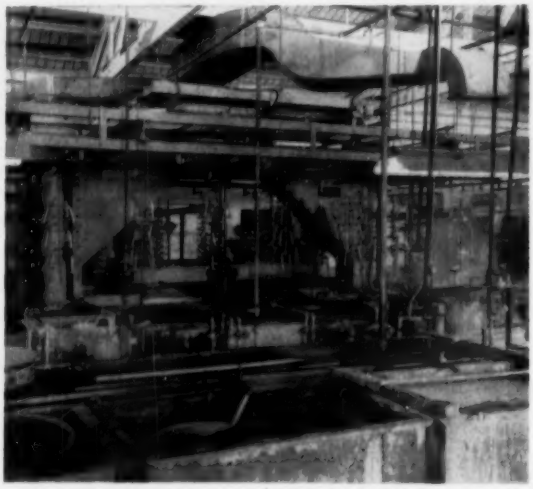
Typical designs range from those for manually-operated machines to fully-automatic, continuous, conveyor-operated installations. Different types of application of the solvents include (1) straight vapor, (2) vapor-immersion, (3) vapor-spray, (4) automatic vapor-immersion and (5) automatic vapor-spray. The solvent is used over and over by means of a condensing unit built into the walls of the tank at the vapor level. The condensed liquid drops back and is used again. Any escape of vapor during this cycle is not only an economic loss, but a health hazard as well.

It is important that the vapor degreasers be of standard manufacture and that the installation of each unit be supervised by a qualified representative of the manufacturer to assure proper location, correct heating and piping connections, and setting of safety devices. No open flame, electric arc or high heat sources should be in the vicinity of the tank, nor should other ventilating equipment, like that for paint spray booths, be nearby to compete.

Air samples should be below a suggested 200 parts per million concentration. Correct respirators of the solvent-vapor absorbing type or air-supplied masks should be worn during the regular tank-cleanouts and someone should be nearby to render aid to the one doing the cleaning, should it be necessary. The tanks should be kept closed when not in use.

Contact of the skin with chlorinated hydrocarbons and their vapors should be minimized, because absorption through the pores may produce the same physiological effect as inhalation. On exposure to high temperatures (e.g. open flames or open electric heaters) the chlorinated hydrocarbons may decompose to toxic and corrosive substances.

In addition to the standard methods of analyzing for chlorinated hydrocarbons, the vapors may be quickly detected and estimated with an analyzer. This instrument measures photoelectrically the spectral line of copper halide formed by the action of the chloro-hydrocarbon on carbon in a flaming arc electrode system.



Plating rooms and shops are careful in disposing of variety of wastes which include spent cleaners, acids, solutions, rinses.

Alkaline Tanks

The alkalies—sodium and potassium hydroxide—have a corrosive and destructive effect on body tissues. They tend to withdraw water from the tissues and at the same time form soluble soaps with the skin oils and the fat layer beneath the skin surface. It is this action that is responsible for the prolonged soapy feeling of the skin which has come in contact with solutions of caustic alkalies.

Caustic burns may penetrate deeper than acid burns. If caustic dust or solution should get into the eyes, it must be removed immediately by washing with plenty of water. Unless this removal is immediate, extremely serious injury to the eyes may result.

Although many of the proprietary alkaline cleaning materials contain percentages of caustic alkalies and in solution possess a high alkaline pH, they are much safer to handle than the raw alkali chemicals. A considerable amount of developmental work has gone into the formulation of compounds which will clean most effectively and economically to meet particular requirements. For example, it is general practice now to electroclean steel and other metals anodically before plating. Although the solutions have high conductivity, ingredients are incorporated in the cleaner to provide for the formation of a foam blanket on the surface. This foam blanket is composed of fine bubbles just strong enough to trap the alkaline spray which otherwise would be raised above the tank, and yet just brittle enough to break before the foam blanket becomes too thick and creates an explosion hazard.

Alkaline cleaning baths, whether used with electric current or not, are usually employed at temperatures ranging from 180° F to boiling, and accordingly workers on such tanks should be supplied with protective equipment such as rubber gloves, aprons and boots. Good ventilation or an adequate exhaust system should be provided for the hot alkaline tanks.

Waste Solutions

In the plating room itself, disposal of spent solutions *(To page 80)*

INLAND 4®-WAY SAFETY PLATE

Because ACCIDENTS are COSTLY, safe, sure footing pays off in higher production, better fire protection and lower insurance rates.

Men "on the move" appreciate the non-skid, slip-resistant qualities of Inland 4-Way Safety Plate. They work faster and more efficiently; morale is generally higher.

The long-lasting qualities of Inland 4-Way Safety Plate means lower maintenance and replacement costs —fewer repairs.

You'll be wise to use Inland 4-Way Safety Plate on all danger spots in your plant and as standard equipment for your products. It's a worthwhile investment any way you look at it.

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INLAND STEEL COMPANY

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SALES OFFICES: *Chicago • Davenport • Detroit • Indianapolis • Kansas City • Milwaukee • New York St. Louis • St. Paul*

PRODUCTS: *Sheets, Strip, Tin Mill Products, Bars, Plates, Structural Shapes, Sheet Piling, Reinforcing Bars, Pig Iron, Rails and Track Accessories*

INLAND

(For further details, use the Reader's Inquiry Card on page 115)

Industrial trucks should carry extinguishers suitable for Class B & C fires.

Safe Use and Care of Industrial Trucks

Industrial trucks have made an almost incredible contribution to production efficiency, but personnel, equipment and even the plant itself are often endangered by careless operation and poor maintenance of the trucks.

WITH our national supply of available manpower stripped year by year to swell the ranks of the "peacetime" army, industry has welcomed the industrial truck as one answer to its problem. These mobile power units have chugged their way into the roster of essential equipment. Gasoline-driven or electric-drive, in factory, pier or warehouse, the industrial tractor or lift truck has innumerable uses. It carries, pushes, pulls, lifts, and tiers material. Among the various types there are fork trucks, platforms, straddle trucks and cranes, powered hand trucks and special designs.

To the casual visitor in a plant where these handy vehicles are buzzing back and forth, the trucks bear a happy resemblance to the carnival "Dodgems" of his youth. All too often, this has been the precise reaction of their enthusiastic drivers. Far too many costly fires and even fatal accidents have occurred with industrial trucks, and industry is seriously concerned over their potential danger.

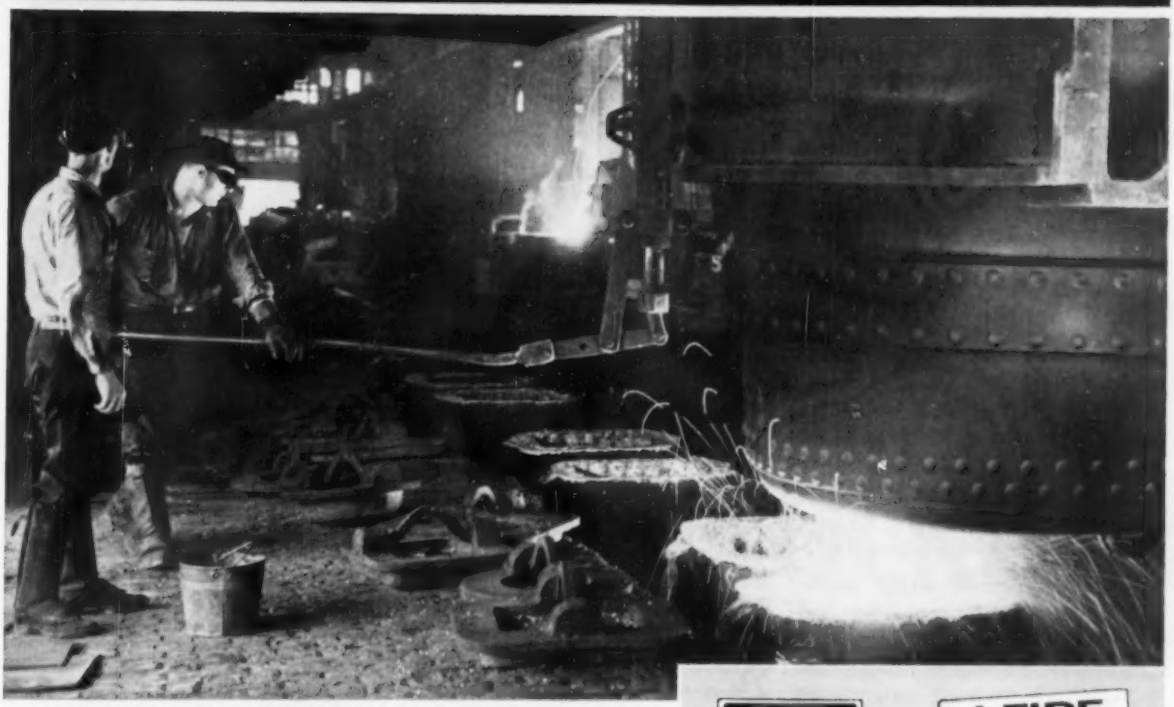
In response to this concern, the National Fire Protection Association has just published pamphlet No. 505B, C, *"Standards for the Maintenance and Safe Operation of Industrial Trucks."* Two years ago the "NFPA," educational and engineering organization for fire prevention and control, set up a conference Committee under the joint sponsorship of NFPA Committees on General Storage, on Storage of Combustible Fibres, and on Piers and Wharves. This new Committee on Industrial Tractors and Lift Trucks has followed the NFPA maxim that potential danger becomes potential safety through careful application of fire protection techniques. Under

Terminal warehouse fire resulted when a lift truck knocked over a salamander.

—Newark Evening News

When lift truck ruptured drum of pyroxylin, fire destroyed 6 trucks & terminal.

STONEHOUSE SIGNS For ACCIDENT PREVENTION



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ACCIDENT PREVENTION • *steel* SIGNS IN STANDARD COLORS AND DESIGNS

(For further details, use the Reader's Inquiry Card on page 115)

Chairman J. Donald Lodge of the Railroad Insurance Association, the Committee has drawn up a set of reasonable recommendations for operating and maintaining industrial tractors and trucks.

Tentative Standards 505 and 505A, covering truck design and types of trucks suitable for use in various locations, are still under current consideration by the committee members, who represent industry, industrial truck manufacturers, insurance circles and fire protection engineers. Since radical changes in design may cause great expense or inconvenience to the truck manufacturer, these standards form the subject of vigorous discussion. NFPA committees strive for a balance between reasonable adjustments and perfectionism in fire safety.

Maintenance of Equipment

Safe maintenance of the trucks demands a place for everything and everything in its place. Designed for safe operation in the location of use, industrial trucks must instantly be withdrawn from service at the first sign of wear, part failure, overheating or spark emission. They must be refueled, repaired and garaged only in separate, specified places. When trucks are repaired, parts must be used which are fully equal in safety factors to the parts used originally. To prevent refueling in work areas when the truck runs out of gas, each truck should be furnished with a lock-type gas tank cap. A readily accessible fire extinguisher in good maintenance should be kept on each truck, charged with such extinguishing agents as carbon dioxide or dry chemical. In winter, only glycol-base anti-freezes should be used.

A clean truck is a safer truck, so weekly steam cleanings are recommended to remove lint, oil or grease. All trucks must be thoroughly inspected at least daily, at the start of the day, or at the end of each shift if the trucks are worked around the clock. Water mufflers which prevent spark emission from backfires, a crucial problem in this field, must be filled daily, or as often as necessary to keep the water supply not under 75% of capacity. Electric vehicles and gasoline trucks both require special examinations to check, where applicable, the battery, wiring, controls, fuel tank, pump, carburetor, brakes, lights, and last, but not lightly, the horn.

Operating Rules

Safe operation of industrial trucks has even more requirements. An operator must pass a physical examination by a qualified physician, to receive authorization to drive his truck. He must have at least 20/40 vision in one eye and 20/100 in the other, with the form field not less than 45 degrees in all meridians from the point of fixation. He must not be color-blind for red, green or yellow. Last, but vastly important, the candidate should leave his sense of humor at home! Horsing around with power trucks has damaged many a sprinkler system and made fire doors inoperable, with frequent spills of gasoline to complicate the picture. Only trained, responsible drivers who keep their sharp eyes straight ahead can be authorized as operators and keepers of the keys. The latter are necessary when a truck breaks down or runs out of fuel in a work area, to prevent attempts at repair or refueling at the scene by unauthorized employees.

Where lighting of the area is less than two foot-candles, the truck must carry directional lights. No truck can be used in hazardous areas unless equipped with safeguards approved by the authority having jurisdiction, and no trucks shall be run on to elevators without specific authorization. It may be noted here that both parts of this combined standard (B, C) forbid the counterweighting of fork trucks to increase their lifting capacity. Speed limits must be observed at all times, and guards or telltales should be installed to warn operators whenever they approach too closely to fire protection equipment or building fixtures.

Where men are working their trucks across bridge plates from a pier or platform into a railroad car, the bridge plate must be securely fixed, and have side guards to keep the trucks from running off. Railroad cars must not be moved when men are working out of them over bridge plates. Further, no industrial truck should tow a railroad car, in spite of the temptation to play David and Goliath.

Examples of Truck Accidents

Three years after Pearl Harbor, in December of 1944 a gasoline-driven lift truck was working on a railroad pier at Newport News, Virginia. As it moved cargo from a freight car, the gas tank was punctured by an obstruction on the car door. Sparks from the truck exhaust ignited the vapors of escaping gasoline, which flowed under the 200 x 800 ft. pier through openings around a railroad section. Although thirty fireboats and other craft were used in fighting the blaze, one man was killed and the huge pier was destroyed, along with forty freight cars; and the loss was over a million dollars.

The NFPA has also recently prepared a dramatically illustrated special bulletin. "Fire Record of Industrial Tractors and Lift Trucks." Few readers know that the 1945 fire on a pier at Point Edward, Ontario, which spread to the passenger vessel S. S. *Hamonic*, was touched off by the backfire of a lift truck. When this backfire ignited the gas and oil around the motor, it started a large-loss fire which destroyed the two-acre wharf, the 365-ft. vessel, railroad rolling stock and freight. Although all of the 397 passengers and crew were saved, many were rescued ignominiously: by a large clamshell bucket, ordinarily used for handling coal. This fire, with other typical examples of fires caused by industrial trucks, is described in the special bulletin, which, like the standards, may be ordered in quantity at reasonable rates from the non-profit NFPA'S headquarters, 60 Batterymarch St., Boston.

Top picture by courtesy of Stop-Fire, Inc. Two bottom pictures by courtesy of National Fire Protection Association.

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(For further details, use the Reader's Inquiry Card on page 115)

Turtle Club Advances

A FEW weeks ago William A. Hendon of Marietta, Oklahoma, became the 75th member of the Turtle Club, exclusively composed of men whose lives have been saved by wearing safety hats while at work.

According to his application, the accident in which Hendon's life was saved occurred last year while he was employed by the United States Forest Service. During a forest fire in the Cabinet National Forest near St. Regis, Montana, Hendon was chopping down a tall spruce in whose branches a parachute containing supplies for the fire fighters had fallen.

Another nearby tree, partially blown down and supported by a number of other trees, broke in two at the point of support and the top portion fell on Hendon. The trunk of the tree, 16 inches in diameter, struck him on the head and knocked him to the ground. His safety hat, however, absorbed most of the impact and he suffered no severe injury.

Membership in the club is gained by filling in an application and giving full details of the accident. Two witnesses must testify to the authenticity of the facts. When admitted, the new member is given a membership certificate, a small lapel button replica of the club's symbol—a turtle waving a safety flag—and a decal for his hat bearing the symbol and the words "Member—Turtle Club."

The club was formed three years ago by C. R. Rustemeyer of Canadian Forest Products Ltd. in an attempt to get loggers to wear helmets. Later the sponsorship of the club in the United States fell to Mr. Edward W. Bullard, who was asked to accept the honor as originator of industrial head protection, and for his contributions to the safety industry for over thirty years.

Among the members are a Virginia shipyard worker who was struck by a five-pound valve that fell 60 feet onto his head. Another is a Hawaiian sugar cane hand who was hit by a crane hook. Another is a New Mexico power company lineman whose hat was chipped by the sharp end of a heavy spike that fell 15 feet.

Former Turtle Club Award: J. B. DeLaune, Basic Refinery Safety Supervisor of the Cities Service Refining Corp. of Lake Charles, Louisiana, presents Rex Hayes with his Turtle Club award. Hayes was standing on the fourth floor of a structure when a saddle support under an exchanger shell fell from the sixth floor. Though the support, weighing 50 pounds, hit Hayes on the head, his hard hat deflected the blow and saved his life.

A Californian described the damage done by a door header that dropped on him. "My neck and spine was badly bent for several days," he wrote, "but not broke thanks to the hat." Another member who survived the blow of a 16-pound ball that fell 10 feet reported no injury.

A foreman was directing a crew lowering material from the second story of a warehouse last fall when a 200 pound 4 x 4 beam slipped its safety catch. "It came down like one of these safety gates at a railway intersection," he said. "The end of it hit the hat. It bent my knees and that took up some of the shock. I heard a buzzing and a ringing in my ears but I didn't fold." The hat was not damaged.

The feeling of most Turtles is summed up, however, in the report of one member who wrote, "Would have been among the missing if I had left my hat at home as I had planned."

Picture by courtesy of Owens-Corning Fiberglas Corp.

Plumbing Stacks Report

"CAPACITIES *of Plumbing Stacks in Buildings,*" by Robert S. Wyly and Herbert N. Eaton, is a National Bureau of Standards Building Materials and Structures Report 132, which may be obtained for 20 cents from the Government Printing Office, Washington 25, D. C.

The problem of the capacity of a vertical plumbing drainage stack in a building has never been solved satisfactorily. This publication reports an attempt to ascertain the maximum load that can be brought into the stack from a horizontal branch when water is being discharged down the stack from fixtures on higher floors—one of the more complicated problems of stack capacities. A theoretical approach to the problem resulted in a formula, which was then tested by experiment.

Obviously no building drainage system can be designed economically unless the minimum sizes of pipes to be used can be predicted. This first phase of a projected complete investigation is concentrated on the drainage stack and its horizontal branches, which comprise most of the larger pipes used in the system.

The report summarizes previous research on stack capacities and gives an account of attempts to define stack capacity. It outlines the problem of stack capacity, describes tests to determine terminal velocities and terminal lengths in stacks and tests on stacks and drains, and analyzes hydraulic and pneumatic conditions in a stack in a multistory building. It also suggests applications of the results of the investigation and lists references to relevant literature.

Use the READERS INQUIRY CARD on page 115

for further information on

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NEW PRODUCTS (Pages 112–114)

FREE BULLETINS & CATALOGS (Page 115)

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THE FIRE FRONT

Supermarket Fires

DURING the past twenty years, the "little corner grocery store" has grown up. It has grown into the huge neighborhood food center that we know as the supermarket. As the supermarket has expanded, the problem of protecting it has also grown, according to a special interest bulletin issued by the National Board of Fire Underwriters. There has been an alarming increase in supermarket fires during the past several years, and the disquieting feature is that a large number of these fires have resulted in total losses. Losses of a quarter to a half-million dollars have become commonplace.

While the number and severity of fires in supermarkets may at first glance seem surprising, a review of their construction and of their characteristic hazards leaves little reason for wonder. As a matter of fact, their unfavorable fire record may be expected to continue without a turn for the better until corrective steps are taken on a substantial scale.

The inherent hazard of the supermarket is its size. A half-acre of wood, wallboard, paper and a myriad of combustible materials creates too large a fire for the fire department, even in a large city with a good water supply, to control and extinguish, unless arrival at the scene of the fire is very prompt. Firemen are unable to reach the center of a burning area of this size with ordinary hose streams, especially when hampered by blank exterior walls or parked autos. If large undivided areas are demanded for this class of occupancy, the only means of properly safeguarding them appears to be by the use of fire-resistive construction or by the installation of automatic sprinklers. The latter seems to be the most practicable of accomplishment.

The majority of large-loss fires has occurred during night or early morning hours, at a time when discovery and alarm have been delayed. Automatic fire detection, either by sprinkler-waterflow devices or by heat or smoke-actuated devices, with alarm transmitted to the fire department, would doubtless have permitted saving some parts of these buildings.

Origin of Fires

The one thing that practically all large market fires have had in common is the section of origin. Report after report gives the origin as some place in the utility area. This leads to the logical solution of cutting off this area from the remainder of the building by a fire-resistive wall with protected openings. A wall of this kind would increase the chances of the fire department to confine a fire to the rear area. A sprinkler system in this area would be a great additional help.

The hazards responsible for starting most supermarket fires are: (1) refrigeration motors and equipment; (2) smoking; and (3) incinerators and heating equipment. Combustible refuse, no doubt, contributed the initial fuel in many of the fires. These hazards can be rendered less potent by proper isolation, such as by location outside the building, by segregation within a fire-resistive room or, in the case of smoking, by designated safe-smoking areas.

The factors mentioned above involving construction, protection and hazards are mainly responsible for the many large-loss fires. One additional factor deserving careful attention by the owner or designer is the location with respect to available public fire protection facilities. A country setting may make a pretty picture, but avoidance of city congestion may also mean isolation from adequate fire protection. There should be as much time spent on the study of the public water supply and fire department facilities, and other protection features, as on the appearance and sales appeal of the building. There is no sales appeal in a heap of ashes!

Inspection Guide

Some of the things that should be looked for in making fire prevention inspections of supermarkets are included in the following suggestions:

1. That first aid fire appliances, such as fire extinguishers and standpipe and hose systems, be installed in accordance with standard practice.

2. That fire extinguishers be recharged and maintained in operable condition, and that other fire extinguishment equipment be properly maintained.

3. That exits be clearly marked, well lighted, and kept free of chains, ropes, or other encumbrances.

4. That all aisles be kept clear of merchandise.

5. That the heating, air conditioning and refrigeration equipments and incinerators be properly maintained and that all chimneys and flues are kept in good structural repair.

6. That motors and other machinery be kept clean and well lubricated, and a service record card kept of each unit or piece of equipment.

7. That a suitable guard such as a wire cage be provided surrounding the refrigeration equipment so as to insure adequate air circulation and prevent contact with combustible materials.

8. That a noncombustible refuse storage bin or fenced area be provided outside of the building, or a special storage room for refuse be provided inside the building; and that refuse be collected as it accumulates and be deposited in the proper bins or rooms.

9. That smoking in the utility area and rooms having combustible refuse be prohibited except in specified rooms or areas especially prepared and safeguarded, with "No Smoking" and "Smoking Permitted"

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Chrome leather, or wool. Plain or steel studded leather reinforcements. Fastens on arm with three adjustable straps, or with zippers.

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U.G. light basket weave asbestos. Six styles offered in one, three, and five piece suits. Each style neatly packed in handy metal carrying case. Used for fighting fires, fire rescue work, and emergency repairs.

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U.G. asbestos, flame-proofed duck and jean cloth, fiberglas, permaproof cloth, and 100% reprocessed wool. 6' x 6' standard size, packed in carrying case. Other sizes cut to order. Grommets supplied on curtains as specified.

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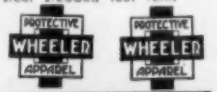
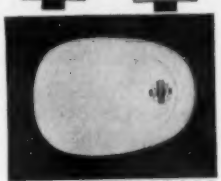
GLOVES Chrome, horse split or grain, and carpincho leather. 11" & 14" lengths. Lined or unlined; plain or steel studded lea. rein.





HAND PROTECTORS With wrist slot, or thumb-type. Chrome lea. with plain or steel studded rein. Asb. backing on some styles.

MITTENS Reg. thumb, rev. thumb, or one-finger styles. U.G. herr. asb. 11", 14", & 23" lengths. Lined or unlined; plain or lea. rein. Double, & triple thick asb. mittens also available.

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U.G. asbestos in tropic-weight herr., light basket, heavy basket, and herr. weaves; flame-proofed duck and jean cloth; chrome lea., permaproof cloth, and wool. Coats 30", 44", and 50" lengths, cut to chest size, with "free-swing" raglan sleeves. Pants to match, cut to waist size.

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U.G. light basket weave asbestos, with wire, fiber, or "hard boiled" head frames, all having adjustable, padded head bands. Screened, and pyrex glass vision pieces; for head, neck and shoulder protection. Large selection of styles featuring exclusive Wheeler design.

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U.G. asbestos, flame-proofed duck, fiberglas, chrome leather, and permaproof cloth. 12", 18", and 24" lengths.

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signs properly posted, suitable and sufficient ash trays provided; and that smoking restrictions be rigidly enforced.

10. That in the sales area, sufficient ash trays or other ash and match disposal containers made of acceptable noncombustible material be placed in locations convenient for customers to use.

11. That employees be properly instructed and assigned duties in the event of fire emergencies; these to include;

(a) Notifying the fire department.

(b) Facilitating egress of occupants.

(c) How to handle and operate the first aid fire appliances installed and available about the premises.

Hydrogen Explosions From Water Decomposition In Fires Are Rare

HYDROGEN explosions from the decomposition of water under ordinary fire conditions are of unlikely occurrence. The danger of such explosions has been exaggerated and there is no reason why a fireman should hesitate to direct streams of water into a burning building on the theory that a hydrogen explosion might occur, according to a bulletin issued by the National Board of Fire Underwriters.

From a scientific or technical standpoint, it is known that red-hot iron and incandescent charcoal or coke will react with steam or water vapor, the oxygen of the water combining chemically with the charcoal or iron or coke. As water is composed of two atoms of hydrogen and one of oxygen, it can be seen that a large volume of hydrogen will be released. This reaction is used in the production of city gas, where steam is passed through incandescent coal, and free hydrogen and other gases are produced, collected, enriched, and then piped through the streets and used for heating, cooking and lighting. Under these conditions there is no explosion as there is no oxygen remaining and none can enter the generator. There must be free oxygen to mix with the hydrogen before it can burn, and before it can burn with explosive rapidity the oxygen must be present in sufficient quantity and must be properly mixed with the hydrogen.

Explosion Conditions Unlikely

Having shown that decomposition can take place, let's see what actually happens in a building on fire, or where there is highly-heated or molten metal, such as iron. First, to obtain this high heat there must have been plenty of air present to supply oxygen to the material which was burning. Under these conditions if there is any decomposition of the water and a liberation of hydrogen there would be a sufficient supply of oxygen in the air to permit immediate burning of the hydrogen. That is, as fast as hydrogen is liberated it would burn, using the oxygen of the air. No free hydrogen would be liberated, to collect at some other place. Under such conditions there cannot be a hydrogen explosion. Hydrogen-air mixtures readily burn over a very wide range, from four per cent of hydrogen to 74 per cent, and the ignition temperature is only 1,085 F, which is well below the temperature of ordinary flame.

The application of water to any mass of highly-heated material, even of wood, results in the almost instantaneous liberation of a large volume of steam, which is often mistaken for a hydrogen explosion. In a closed room or other confined space, this quick liberation of steam may blow out windows and even blow down walls. This is one reason why it is well to open windows and doors when attacking a hot fire.

Magnesium Fires

In this connection, it is necessary to consider magnesium alloys which are being used in greater quantities each day. Magnesium if hot enough reacts violently with water with liberation of hydrogen, but the idea has been overdone that water should never be used on any kind of magnesium fire.

Where a considerable quantity of magnesium in the form of chips, turnings, or shavings has ignited from any cause, the impact of a stream of water is likely to cause considerable scattering of molten and burning particles. Magnesium in these forms burns readily, and water penetrating to the burning magnesium underneath causes explosions with scattering of molten and burning particles.

In fighting fires where magnesium is in sheets, castings, shapes and manufactured articles, if enough water can be applied quickly to burning magnesium to lower the temperature sufficiently to prevent the reaction with water, there is no explosion and the fire is extinguished. Due caution must be taken in the use of hose streams and it is well to apply such streams from as great a distance as possible and still have a good solid stream at not very high nozzle pressure.

Magnesium in its solid form melts as it burns, and if the fire has been burning long enough to produce considerable molten magnesium, application of water will present the hazard of steam explosion associated with all hot molten metals in contact with water, but increased by magnesium's greater affinity (attraction) for oxygen. Severe explosions result when a mass of hot molten metal is poured onto a water-wet surface, or is dropped into water; also when water is injected under the surface of the molten metal. Whether with molten magnesium these explosions are hydrogen or steam explosions may make little difference.

The danger from any resulting explosion may be lessened by providing as much vent area as possible, as by opening windows, doors and skylights.

What's New?
See pages 112–114

SAFE PRACTICES #107
FLOORS AND FLOORING
"It is recommended that a specialist be called in to give on-the-spot appraisal of special problems in connection with slippery floors....."
Reprinted from NATIONAL SAFETY COUNCIL pamphlet #11

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(For further details, use the Reader's Inquiry Card on page 115)

Mechanization of Farms Poses Safety Problems

Better Fire Protection Is Necessary

DESIGNED to help farmers reduce the threat of fire damage to farm buildings and property, a new booklet, "Your Farm and Fire Safety" has just been published by the National Board of Fire Underwriters. It is available for free distribution to the farmers of the nation through local fire departments, insurance agents and farm organizations.

"Your Farm and Fire Safety" replaces another booklet "Fire Safety on the Farm," which was published in 1947. The new booklet was made necessary by the many new developments in farm mechanization and resultant growth of new fire hazards.

"The swift advance of science and technology have brought many new fire hazards to the farm," the booklet states. "The modern farm is no longer an island of security, remote from danger. Today it has all the hazards of machine shops, factories, gasoline stations, paint shops, combined with frame buildings holding tons of hay and straw—and all these with no hydrants and several miles distance from the nearest fire department."

The booklet points out that farmers should give thought to fire safety considerations every time a building is planned, when new equipment is added, when meeting with other farmers, or when the budget is planned.

It describes means of establishing adequate water supplies, types of extinguishers to use, recommends alarm systems and urges support of local rural fire departments.

Common hazards, such as careless smoking and misuse of electricity, as well as special hazards such as faulty installation of power equipment, are pointed out. The farmer is urged to inspect his farm regularly for fire hazards.

The farmer is also warned about the danger from fires out of doors, and is given instructions for safe burning of rubbish and clearing of lands.

The booklet was prepared after consultations with safety experts of the U. S. Department of Agriculture, Underwriters' Laboratories Inc., the agricultural committee of the National Fire Waste Council, and farm organizations.

Copies may be obtained free by writing to the National Board of Fire Underwriters, 85 John Street, New York 38. In the Middle West, inquiries should be sent to the National Board of Fire Underwriters, 222 West Adams Street, Chicago; and west of the Rockies, to the National Board of Fire Underwriters, 465 California Street, San Francisco, Calif.

Locating Fire Alarm Circuit Troubles

IN COMMON with other electrical circuits those of a fire alarm system are subject to derangements and interruptions which may range from minor to serious. Grounds and open circuits occur most frequently; crosses and shorts less often, according to a recent bulletin of the National Board of Fire Underwriters.

Grounds

Grounds are caused by complete or partial breakdown of conductor insulation from ground. A single ground does not normally introduce operating difficulties, but more than one ground may cause current to leave its proper path by furnishing another path through the earth. If one-third of the normal line current is diverted through the earth, boxes and instruments become unreliable in operation even when in perfect condition and adjustment. If their adjustment is imperfect, operation may be impaired by diversion of a lesser part of the current.

Voltmeter readings taken between ground and each side of a circuit give the drop in voltage along the line from the terminal to the ground and through the tree branch or other means by which the circuit is connected to the earth. If the ground fault has very little resistance the ground is a serious one. This condition is indicated when the sum of positive and negative readings is very nearly equal to the voltage across the line terminals. A ground should be cleared long before it has reached this serious condition. In fact, efforts should be made to locate and clear a ground immediately when the sum of its positive and negative readings is as great as half of the terminal line voltage.

For example, if the terminal voltage is 30, the positive ground reading is 5 volts and the negative ground reading is 10 volts, the sum of the two ground readings, 15 volts, is half of the terminal voltage and immediate action is required to clear the trouble. The fact that the positive ground reading is less than the negative reading indicates that the trouble is nearer the positive line terminal (measured along the line) than it is the negative terminal.

A portable voltmeter having 150-, 50-, and 3-volt scales is used to locate the ground fault. Starting at the positive line terminal, tests may be made at about one-third the distance along the line from headquarters (5 divided by the sum of 5 plus 10 equals one-third.) Voltage readings should be taken at boxes by connecting the positive terminal of the voltmeter to the line and the negative terminal to ground. As readings are taken at successive boxes the meter readings will decrease as the fault is approached and increase with reversed polarity after it has been passed. In this manner the ground can usually be localized between two fire alarm boxes, and then found by a close inspection of the line between the last two test locations.

It is helpful to establish the ratio of ground readings for each box location before trouble occurs. Although ground test readings vary with the resistance of the ground, being greater when the ground re-

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ABOUT TOXICITY

The toxicity of Carbon Tetrachloride results from one of two factors, or both:

A. Decomposition of Carbon Tetrachloride in the presence of heat and iron, the by-product of which is phosgene.

B. Hydrolysis of Carbon Tetrachloride resulting in hydrochloric acids.

In the first instance the lungs are affected, and in the second, permanent damage occurs to the liver.

In compounding FO-101 and FO-128, we have taken into consideration not only the maximum allowable concentration of the various chlorinated solvents, but their vapor pressure as well, since each must be considered in direct relationship to the other.

The maximum allowable concentration and vapor pressure of the materials in "FO" products, as compared with the Carbon Tetrachloride, are as follows:

	M.A.C.*	V.P. at 25°C
Carbon Tetrachloride	35 PPM	115.0
Percentage of Chlorinated Solvent in FO-128	100 PPM	18.0
Percentage of Chlorinated Solvent in FO-101	50 PPM	1.8

*American Conference of Government Industrial Hygienists, 1951.

Toxicity is determined not only by the maximum allowable concentration, but the rate at which it is reached; the latter is governed by the vapor pressure, and therefore the safety quotient, as defined below, should be considered as a guiding factor.

In considering the toxicity of a material, in the light of the table given above, the quotient resulting from the maximum allowable concentration divided by the vapor pressure, should be the guiding factor. In other words, this safety quotient for Carbon Tetrachloride is 0.3, for the percentage of chlorinated solvent in FO-128 it is 5.6, and for the percentage of chlorinated solvent in FO-101, it is 57.8. Therefore, the percentage of chlorinated solvent in FO-128 appears to be eighteen times as safe as Carbon Tetrachloride, and the percentage of chlorinated solvent in FO-101 ninety-two times as safe as Carbon Tetrachloride.

In comparing our solvents with Carbon Tetrachloride, consideration should be given to the fact that our solvents are composed only in part of chlorinated materials. Hence, comparisons should be made on the basis of volume of whole product (ours) vs. 100% Carbon Tetrachloride. You will also note that the vapor pressure of Carbon Tetrachloride at room and summer temperature is considerably higher than that of the chlorinated solvents percentage in FO-101 and FO-128, yet its PPM in allowable concentration is much lower.

Toxicity is minimized because of the lower initial concentration and lower vapor pressure that will not reach the M.A.C. as quickly as Carbon Tetrachloride, hence our products are appreciably safer to use. This safety is enhanced by our selection of auxiliary solvents on the basis that the percentage of chlorinated solvent remains fairly constant throughout the evaporation cycle, thus assuring uniformity in effectiveness and safety of handling.

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sistance is low, their ratio is the same for any particular location along the line.

The above method does not work when there is more than one ground on a circuit. Ground locations then cannot be determined by proportional test readings and readings taken at street boxes will not give true indications. With no more than two serious grounds, voltage test readings taken along the line will reverse polarity at some point between the grounds. This point would not necessarily be halfway between the grounds, but would be nearer the one having the lower resistance. Field tests will give best results when the air is dry. Grounded circuits should not be connected in series.

Open Circuits

Open circuits may occur from breaks in conductors, defective splices or corrosion at terminals. Some are caused by blowing of circuit fuses following conductor contacts with power wires or by fusing of line conductors from the same cause. Falling conductors may come in contact with grounded objects or puddles of water. In such cases correction of the open circuit condition will cure the ground trouble.

Many open circuits can be located by line inspection. To locate a hidden open circuit, with or without an accompanying ground, remove the protective terminal fuses from both sides of the line and connect one terminal of the secondary of a 24-volt transformer to the line side of one of the circuit fuse clips. Connect the other terminal to ground and energize the transformer. Use a portable telephone receiver to test from line to ground at successive boxes along that side of the circuit which connects to the transformer. The open circuit will be between the last box where an a-c hum can be heard and the first box where it cannot.

Intermittent Open Circuits

Intermittent open circuits of short duration are difficult to locate with ordinary methods. However, a special device has been developed by means of which this form of circuit trouble can be localized readily. With a good ground on one side of the current supply in the fire alarm office, line voltage to ground under normal conditions ranges from nearly terminal voltage near the office on the ungrounded side to about zero near the office on the grounded side of the circuit. When an open occurs, line voltage between the open and the ungrounded terminal rises to full supply voltage; between the open and the grounded terminal it falls to zero.

The device is in the form of a special voltmeter with adjustable resistance. Small permanent magnets at each end of the scale hold the pointer at maximum or zero reading following the voltage swing which is to be noted. The device is small enough to be placed within the inner case of a fire alarm box where one of its terminals is connected to the line and the other to ground. Current drawn from the line by the device is negligible.

To localize the open circuit trouble the device is placed within a fire alarm box near the center of the circuit; the pointer is released from either of the magnets which may be holding it and the resistance is adjusted until the pointer is in the center of the scale. The box door is closed and nothing more is done until an intermittent open occurs. The device is then inspected. If the pointer is found to be held at full scale voltage the trouble will be in that half of the circuit between the test box location and the grounded side of the current supply. If the pointer is at zero scale the trouble will be in the other half of the circuit. It will be necessary to reset the pointer whenever any signals have been transmitted over the circuit.

Having determined which half of the circuit is in trouble, the device is then placed in another box midway in that half of the circuit and the operation repeated. If the open occurs in the ungrounded half of the line it may be necessary to ground the other polarity of the current supply to provide sufficient voltage to ground for further testing. Two observations serve to localize the trouble in one-quarter of the circuit using one device. Using two devices, the trouble can be localized in one-third of the line with one observation and in one-ninth of the line with two observations.

Acknowledgment is made to the authors of several articles on locating fire alarm circuit troubles which have been published in the "Municipal Signal Engineer" of the International Municipal Signaling Association.

Mishaps in Candy Plants Cost $5,000,000 a Year

ACCIDENTS to workers in candy plants are costing the industry approximately $5,000,000 a year, a safety expert told the National Confectioners Association's 69th annual convention.

R. E. Dalstrom, midwest safety director of an insurance company, said the average cost of an industrial accident under present compensation laws is almost double that of 10 years ago.

He told a session in the Conrad Hilton Hotel that the estimated $1,250,000 annual payments to employees for disability and medical payments cannot be construed as the sole cost of accidents.

"Add to this figure all the other indirect losses which affect production schedules, and the total industry loss can be $5,000,000," Dalstrom stated. Some factors adding to the mishap cost are as follows:

1. Employees in the vicinity of an accident stop work to assist the injured worker, look, or find out what happened. In case of serious accident, the efficiency of the entire plant may be impaired for the rest of the day.

2. Reduced efficiency of temporary or substitute workers, especially if the injured worker was performing a specialized job.

3. Mounting costs of detailed operations including preparation of reports, investigations, and testimony at hearings.

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THE ATOMIC FIELD

Gamma Penetration

ACCOMPANYING the increased use of radioactive materials in industrial research and medicine is a growing concern for the harm radiations from these materials can inflict on personnel. To aid in reducing these dangers to a minimum, the National Bureau of Standards, in cooperation with the Office of Naval Research and Atomic Energy Commission, has been conducting a theoretical and experimental investigation of radiation shielding devices. This particular program is devoted largely to studies of the distance radiations travel from their sources and the transformations they undergo during the process. The experimental phases of the work are designed to yield information that is essentially general in nature but which can be readily adapted to specific problems. Whenever possible, the experiments are carried out on a small scale or on a model. In this way, a wide variety of investigations can be made of the protection problems associated with devices such as very large nuclear reactors. Ultimately, the accumulated data will form a basis from which radiation barriers of the correct thickness and material may be designed for economical and safe protection.

One series of experiments on the penetration characteristics of gamma-rays utilized a large tank of water to simulate effectively an infinite medium. Radioactive cobalt (Co^{60}) served as the source of gamma rays, and two experiments were conducted, one to determine the intensity, the other to determine the quality of the radiation at varying distances from the source. In the intensity experiment, conducted by Gladys White of the NBS staff, the Co^{60} source was suspended in the middle of a 60-foot water tank. The amount of energy dissipated in the medium was measured with an ionization chamber and a Geiger-Muller counter at increasing distances from the source. The data showed that the decrease in the total intensity of the radiations closely approached the trend predicted in theories previously developed by NBS.

Determination of the quality of the radiations was delayed for some time because of a lack of techniques for measuring the energy spectrum of secondary electrons. Recently, however, a new method, that of scintillation spectroscopy, has been adapted by Dr. Evans Hayward, also of the NBS staff, to determine the energy of fast moving electrons generated by gamma rays. This technique was employed at NBS to observe the quality of the radiations by measuring the scintillations they produced in an anthracene crystal. These observations, too, agreed very well with NBS theoretical predictions.

Atomic Age Fires

THE Board of Directors of the National Fire Protection Association has considered measures for fire safety in the atomic age. A seven-point program was outlined to the leaders of this non-profit, technical and educational association devoted to fire prevention work by its chief engineer and civil defense expert, Horatio Bond. He reported that while the atomic bomb gives off tremendous heat which will start many fires, that by a series of measures, many of them inexpensive, the people in cities can greatly increase their chances of survival under an A-bomb attack.

The seven points in this recommended fire safety program are: 1. more space between buildings, 2. a radical reduction in use of combustible materials, 3. fire-resistive building construction, 4. automatic fire protection of buildings by sprinkler systems, 5. organized teams of citizens to fight fires with extinguishers and stirrup pumps, 6. water for fire fighting to be stored in tanks at buildings because there may be no water in city mains, 7. day-to-day attention by owners and managers of buildings to maintaining a high order of housekeeping and general alertness against potentially dangerous fire situations.

A tip-off to the imminence of an A-bomb attack, Mr. Bond believes, may be the issuance of orders by civil defense authorities to remove all needless fire hazards, like rubbish and litter, from back yards and attics, the removal of dilapidated porches, fences and sheds and the replacement wherever possible of combustible roof coverings with asphalt shingles or other material which has a degree of fire resistance.

Citizen Fire-Fighters

A well-organized home army of citizens, equipped with pump tank extinguishers, stirrup pumps and simple fire-fighting equipment, will be able to combat successfully a good many small fires, he says. In many cities this should be expected to keep fires down to a number which can be handled by the public fire-fighting forces. According to Mr. Bond's analysis of American cities, this first-aid fire fighting will be of major importance if cities are to avoid disastrous conflagrations and fire-storms as a result of an A-bomb attack. A fire-storm or mass fire is most to be feared, it was reported, because it could cause huge casualties. Casualties in World War II attacks resulting in fire-storms were cited: Tokyo 84,000, Hamburg 60,000, Hiroshima 70,000.

Mr. Bond pointed out that, in peacetime, important buildings, such as industrial plants and department stores, are protected with automatic sprinklers. These systems, which put water on a fire without manual assistance, reduce fire losses to something below ten per cent of what otherwise would

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be the case. In wartime, he believes these systems will be intact wherever buildings are standing and that if sprinkler protection is installed in a larger proportion of buildings, the survival rate against the fire effects of A-bombs, for both buildings and people, will be high.

It was pointed out that the application of this program would mean a modification of normal warehousing practices in buildings and elsewhere to limit the total amount subject to destruction in any one location. This principle places a limitation on combustible buildings which must be small and well spaced and it limits the areas and heights to reasonable figures even when so-called "fireproof" building construction is used.

Future Uses for Fission Products

A POTENTIAL large-scale demand for fission products exists in industry, but many technical and economic problems must be solved before promising new uses for these by-products of the atomic energy program can develop. This was the broad finding and conclusion of Stanford Research Institute from a recent techno-economic survey of industrial uses of radioactive fission products conducted for the United States Atomic Energy Commission and announced in a report issued recently.

Published by the Institute, the report presenting the survey findings does not necessarily represent opinion or policy of the AEC. To encourage further study by industry of possibilities of use, the Commission has authorized the Institute to make the report available at cost.

Millions of curies of radioactivity are contained in the process wastes left over from the production of plutonium in the AEC's nuclear reactors. Of no usefulness for industrial or explosive power or as a heat source, these fission products are known to be a potential source of large quantities of low-cost radiation. Refinement and concentration of the gross fission products, now stored at AEC installations, will undoubtedly be necessary to make them suitable for industrial purposes, the SRI study indicates.

Promising industrial applications for fission products are to be found in various stages of technological development, according to the report. One table sets forth in summary form the approximate state of technological development of selected large-scale potential industrial uses, the fission products required, the maximum value-in-use or competitive price, the size of the market and the nature of the competition.

Present commercially feasible industrial uses include the activation of phosphors for self-luminescent signs and markers, static eliminators for a variety of industrial processes, the reduction of starting voltage requirements in fluorescent light tubes and in process control instruments which incorporate a source of radiation.

Possible future uses for fission products, where the technology and desirability of use will require at least two to five years for development, include industrial radiography, cold sterilization of drugs and foods and portable low-level power sources. In the highly speculative area where basic technical knowledge is lacking, possibilities exist for uses in radiation chemistry and flame propagation.

Toxological testing will have to be a part of the experimental and developmental program for any sterilization processes contemplating the use of fission products radiation. The report stresses, however, that fission products can be used with safety by industry and that there is no danger that secondary radiation would be induced into products that are treated with fission product radiations.

There are definite signs that both industry and the Commission are beginning to move ahead with research programs aimed at developing large-scale uses for fission products, says the report. The announcement last July that Brookhaven National Laboratory has a 1,000-curie source available for experimental use by industry has met with immediate industrial acceptance. The Commission is sponsoring research programs at several universities, aimed at assisting industry in this field. A number of prominent industrial concerns have expressed interest in pilot plant operations, especially in the field of radiation sterilization, as suitable fission products become available.

What Is Safety?

A RECORD of having gone for more than three-and-a-half years without a single lost time accident has been made by employees in the storeroom at the Ambridge, Pa., plant, Spang-Chalfant Division, The National Supply Co.

Seeking to discover their "secret," the editors of "Thread Chips," the plant publication, asked the eight employees to what they attributed their good record.

According to H. J. Vallecorsa, it's because "all storeroom employees have a thorough knowledge of the regulations and avoid short cuts." T. L. Simpson attributes the record to the "alertness of our men and the patience of our foremen."

Herbert Holmes says it's from "having our minds on the job we're doing and watching out for the other fellow." Patsy Frank says it's because "as soon as we're hired we're instructed about safety."

Walter Karda says it's "because our foremen practice safety and always remind us about it." Leslie Pettner sees the secret in teamwork and working together." Neil Snoderly says it's because "the storeroom is kept clean and orderly; therefore there are fewer hazards." Paul Rull, foreman, says it's because "no one rushes us."

All of the men are proud of their record. Admitting that their work is not as hazardous as in some other departments, they point out that it presents many possibilities of injuries unless the men are alert and careful.

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TRANSPORTATION SAFETY

New ICC Regulations for Fire Extinguishers on Trucks and Buses

DECEMBER 31, 1952 is the deadline for operators of trucks and buses to equip their vehicles with more fire protection. The changes in the Interstate Commerce Commission's rules governing fire extinguishers have been brought about by the increased size of trucks and buses and the greater number of such vehicles using the highways today.

The regulations state that the extinguisher shall utilize an extinguishing agent that does not require protection from freezing, shall be properly filled, and shall be securely mounted in a bracket. Three approved types of extinguishers are specifically mentioned, and, if other types are used, they must have an equivalent extinguishing capacity. The new size requirements may be fulfilled either by substitution of a larger extinguisher for the former smaller unit, or by installing additional small units that will equal the minimum requirements.

The rules for the three approved types of extinguishers are for vaporizing liquid units of 1½-quart capacity (formerly 1 quart), carbon dioxide extinguishers of 4-pound capacity (formerly 2 pounds), and dry chemical extinguishers of 4-pound capacity (formerly 2 pounds).

Bus and truck operators have until the first of next year to protect their vehicles in accordance with the new regulations, and, by so doing, to protect also their own property and profits.

Are Accident Victims Human?

THE future pattern of preventing accidents on the highways and in industry may need increased emphasis on human engineering as a new safety technique that will "save people from themselves" by dispelling the notion that they "lead a charmed life," the Virginia Statewide Safety Conference was told by J. Dewey Dorsett, general manager of the Association of Casualty and Surety Companies.

Asserting that 93,000 Americans were killed and another 9,100,000 were injured in accidents that cost $8,000,000,000 in 1951, Mr. Dorsett said the greatest problem confronting the safety movement is the task of "selling individual responsibility" that will prevent accidents.

"We must bring into the consciousness of our fellow Americans that not mere statistics were killed, it was people," the speaker declared. "The death of 37,500 persons in motor vehicle accidents in 1951 must be shifted from a statistical table into the death of human beings, each one of them as valuable to the family and to society as you or I; each one of them possessed of a lust for life and living, eating and working or studying, just as you or I.

"They were not a mere abstract impersonal 37,500 digits who might as well have lived on Mars for as much as most appear to care, but rather they were people whose chances of living and receiving pay checks had appeared as good as ours do today."

Human Relations Problem

Pointing out that while the United States this year is celebrating 40 years of an organized safety movement, motor vehicle accidents led the list last year as the nation's No. 1 accident killer, with home accidents second, Mr. Dorsett said this record shows that "we have not yet convinced the individual of his personal responsibility to work safely, to drive safely, to think safely and to live safely." Apparently, he added, "our task is to save people from themselves. We may attribute this need to a strange perversity in human nature which stubbornly refuses to heed warnings and considers accidents only in terms of application to someone else but does not refuse to bemoan the fact that this condition exists."

Mr. Dorsett emphasized that the tried ways of making highways safe eventually get down to the individual, who then "applies them to 'the man who lives across the street.'" The speaker said the individual is not yet willing to accept the premise that driving a motor vehicle is a privilege which he retains only as long as he uses it reasonably, and not a right which is guaranteed by the Constitution.

"Only in such a psychology," said Mr. Dorsett, "can we account for the shrugging off of an annual casualty list of death in the tens of thousands, injuries in the millions

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and property damage in the billions. Ours, then, is not merely a search for a sliderule formula—ours is a research assignment in human relations—to attain application of the dangers from traffic accidents to the individual and in so doing to develop an improved attitude toward highway safety so that the words 'I am a safe driver' will bespeak prideful performance rather than a back-slapping platitude."

What Mr. Dorsett described as "the pleasure of beating Lady Luck" by taking chances and still avoiding accidents, whether in industry or on the highways, "must be replaced by a feeling of awareness or conviction that Lady Luck has more lives to lose. She has a lot more throws in her box of dice than he has," he declared.

The greatest problem in any branch of safety—in industry, on the highway, in the home or on farms—is to revise the individual attitude and pursue that advantage by using various new techniques that might cut the accident toll, according to Mr. Dorsett.

Future Safety Trends

"Naturally we cannot toss out the window all the technological safety advancement of the past," he said, "nor can we cease to expand our efforts to improve the machines and the methods. However, we may well find it necessary to shift our emphasis from mechanical engineering, or even from safety engineering, to human engineering if we expect to get to the heart of our greatest problem. While our future pattern may rest in the hands of the sociologist and the psychologist, I cannot help but foresee some of the courses we can follow. Safety can never become a continued reflex. As long as intelligence is a factor, man must use that intelligence to keep himself safe in any given situation."

Among the future courses in safety to be pursued, Mr. Dorsett outlined the following:

"First—persistence—in telling the safety story again and again, trying only to dress it in the latest fashion. Our assignment is nothing more nor less than a sales campaign. When we break down sales resistance the attitude which moves into the mind makes our individual subject ready for safe living. I say that a message must be modish because we must avoid the pitfalls that there is anything synonymous between dull living and safe living. In this century, safe living should be a lot more exciting than careless living—it seems to be much easier to be involved in an accident than to avoid one.

"Second — research — into new fields of human reaction to determine why people do what they do in accident-potential situations. In highway safety, for example, it will no longer suffice to determine that the would-be driver has the manipulative skills, the quickness of reaction, the vision, the hearing and a knowledge of the rules of the road. Finally, we must test emotional

stability in an effort to learn before exposure how this driver will react. I have always wondered about the nearly 4,000,000 young men rejected for active service in World War II due to psycho-neurotic reasons. How many of that four million are licensed drivers today? If they lacked the stability for the tight situations of warfare, what do they do in the maelstrom of city traffic congestion or in the excitement of 70-mile-an-hour speeds of our newest superhighways?

"Third—specific action; in every phase of safety, our program depends upon something specific to do. Safety cannot thrive, cannot even survive, on hopeful promises, great expectation, or vague generalities. Across the board what we must do and how we must do it is the joint responsibility of public officials, organizations and groups directly affected in a business way by accidents, and the general public. In every category there is some agency of federal, state or local government. It is my belief that this public official should provide a full share of the initiative for specific action. The other share in launching definite action rests with those industries and professions having an economic stake in accident reduction. Finally, regardless of official or business interests, accident prevention must win public understanding and public acceptance if our whole concept is to prevail."

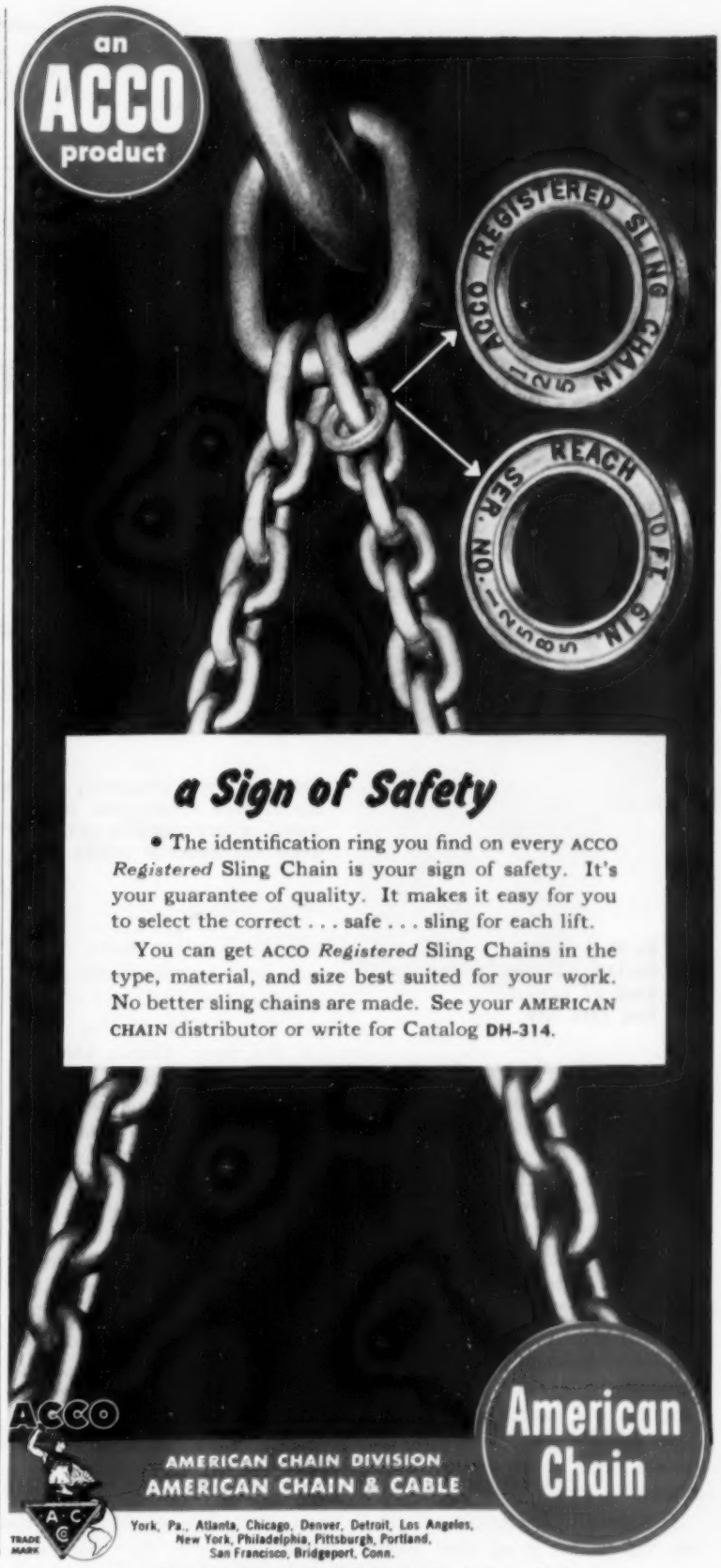
Imagine the Hazard

"IMAGINE the Hazard" is one mental game that every motorist should play as he drives along. Playing this game may be the means of saving his life or the lives of others by avoiding an accident just around the next corner or over the next hill.

For, according to the Institute for Safer Living, the best way to avoid auto accidents of the type that most frequently happen is to imagine that at any moment you may face an actual emergency.

The game is a way of remaining

(To page 74)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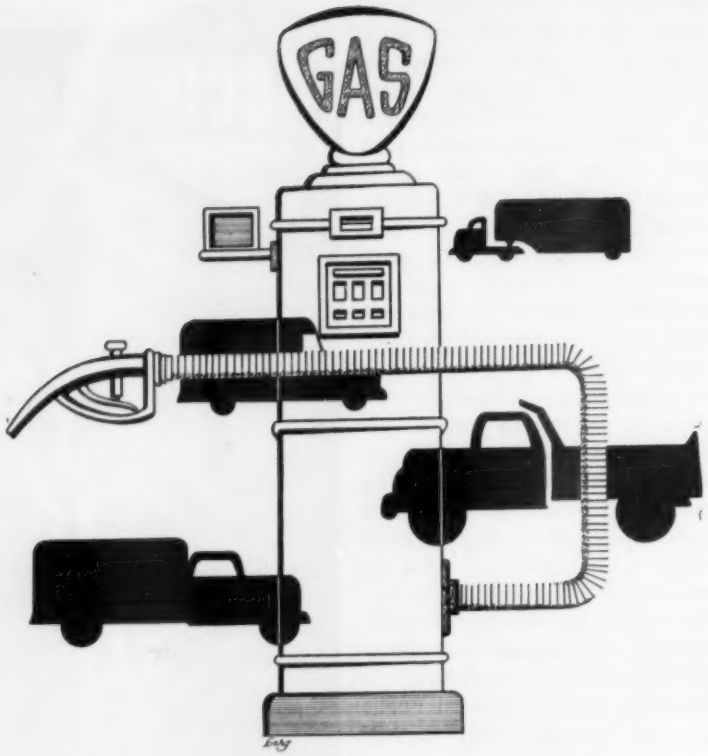
Fill The Tanks With Safety



This story was originally developed as a guide to gasoline service station employees, but its rules for the safe handling of gasoline are equally pertinent for motor fleets, garages and even the general public.

By W. N. YOUNG
Marketing Safety Engineer
Shell Oil Company
New York City

GASOLINE is one of our most useful materials. It can also be one of the most dangerous—if it is improperly handled. One gallon of gasoline can move a 3,000 pound passenger car as far as 20 miles. That's under carefully controlled burning conditions. Unleashed all at once, in an explosion, this tremendous energy could destroy a multi-story building. But if you understand the hazards that gasoline presents, and handle it with care at all times, a gasoline fire or explosion need never destroy a gas station.

The same characteristic of gasoline that makes it an ideal motor fuel is the one that makes it hazardous: high volatility—the ability to evaporate readily. And it's the vapor that ignites, causing explosions and fires. Unlike kerosene, which must be heated before it vaporizes, gasoline vaporizes at all ordinary temperatures, even in subzero weather. That's why there is an ever-present hazard in gasoline.

When gasoline evaporates, the gasoline vapor mixes with the air, and it's the proportion of that vapor in the mixture that determines whether or not there is a combustible mixture. If there is from one percent to six percent of gasoline vapor (by volume), look out! The slightest spark will cause it to ignite instantly.

Incidentally, that's exactly what happens in the combustion chamber of an automobile engine. But in the engine of a car, the tremendous power of gasoline is controlled. Anywhere else around a station, gasoline can get out of control in a hurry.

You might expect gasoline vapor to be very light, because gasoline evaporates so readily, but the exact opposite is true. The vapor is from two to four times heavier than air, so it tends to settle in low places. If there is no wind or air current to disturb it, it may remain there for considerable periods of time before it becomes so diluted with air that it will not ignite.

Understanding these characteristics makes it easy to understand precautions necessary in handling gasoline.

Be sure the car's engine is shut off before the cap comes off the gasoline tank. A spark from the ignition system or from the exhaust may ignite the gasoline vapor.

Insist there be no smoking. Natu-

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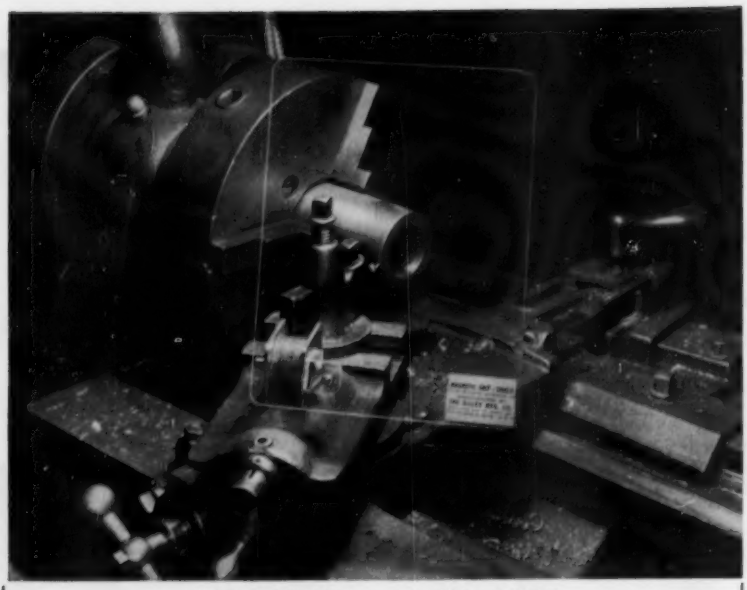

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rally, the dealer will not permit smoking among his employees on the job. But a customer's smoke can cause just as much trouble as anybody else's. For the safety of everybody concerned, the dealer is perfectly right in courteously requesting his customers not to smoke or light matches near the pumps or in the service rooms. Invisible gasoline vapors may be anywhere, and a carelessly flipped cigarette might set the customer's own car on fire.

Maintain nozzle-to-tank contact. Insert the hose nozzle firmly into the tank and maintain metal-to-metal contact until gasoline delivery is finished. Flowing gasoline may generate static electricity. Without contact, the charge may build up and arc between nozzle and tank.

Remain at the tank until it is filled or until the ordered quantity is delivered. The fire underwriters will not approve any rachet device designed to shut off gasoline flow when the tank is full. They have had too many cases where these devices failed to function.

One of the worst cases happened when a customer left his car at a garage for service, with instructions to fill the tank. The dealer turned on the automatic shut-off nozzle and went to answer his telephone. Many minutes—and gallons—later, after the shut-off had failed to operate, gasoline had flowed over the drive, and hundreds of feet down the curb. There it was somehow ignited. Fire flashed all the way back, burning cars parked at the curb, damaging store fronts and completely destroying the customer's car also. Don't take a chance—watch that tank.

Avoid spills. While the tank is being filled, gasoline vapors will not travel far, ordinarily. But when there's a spill, a large area is exposed to the air; vapors are unconfined and can drift in any direction. And they can travel a long way. In a recent instance, gasoline vapor drifted from the pump island all the way across a torn-up street. Here it was ignited by a flare and flashed back so rapidly that the dealer's hands were burned. The customer's car was destroyed.

If you have a spill, *push* the customer's car from the driveway immediately. Caution the customer not to start his engine until the spill is removed. Wash down the spill area on the car with water. Gasoline on the drive must be flushed off with water, and thoroughly removed.

There's something else to remember about spills: no customer likes to have gasoline splashed on the finish of his car.

There is also great danger in spilling gasoline on the skin or clothing. Change your clothing immediately if it is saturated with gasoline. In one instance, a service station employee with gasoline-soaked clothing walked into the salesroom. Vapor from the clothing drifted to a small stove and fire instantly flashed back to the man's clothing. Result: serious injury.

Wash gasoline from the skin, whether the gasoline contains tetraethyl lead or not. Repeated washing of the hands in gasoline may cause severe inflammation of the skin, similar to a burn.

Never use gasoline for any type of cleaning. Every year service stations are destroyed by fire or explosion, dealers and employees are killed or maimed because gasoline is used for cleaning around the station. And tell your customers that gasoline is not a cleaning fluid.

Use only approved containers for gasoline. Never place gasoline in glass containers: they are too easily broken. Use only safety containers with tight-fitting covers. The container should be painted red, and should be clearly marked to indicate that it contains gasoline. Practically all gasoline today contains tetraethyl lead. Warn your customers not to use it in gasoline stoves or lamps.

Never store gasoline in your station. And that means anywhere in the station. Even though you don't have an open fire in the station, there are still ignition sources. Every time your compressor motor starts,

every time someone flicks an electrical switch, and every time someone inserts a plug in an outlet, there's a spark. It may be so small you can't see it, but it's enough to ignite gasoline vapor.

There need not even be a spark. The glowing wires of a small electric heater can cause a fire. And a broken light bulb, in the fraction of a second before it goes out, glows with an intense heat which can cause a shattering explosion when gasoline vapor is present.

And that has happened. An attendant used a mixture of gasoline and water to clean a lube pit. With an extension cord, he hung a bulb over the side of the pit for light. The bulb was protected with a heavy wire cage. But the cage offered no protection against liquids. The attendant's mop splashed the gasoline-water mixture onto the bare bulb. The bulb shattered, and the attendant was badly burned in the resulting explosion and fire.

Leave vehicles with filled gasoline tanks outdoors during cold weather. Here's a new one. You won't find it in the safety rules. It happened to a dealer early this year.

After filling the tanks of a truck, this dealer brought the truck into one of the closed service bays, planning to wash it the following morning. It was a cold day, and the gasoline expanded in the tanks.

Closing up about 10:30 p.m., the dealer smelled gasoline. He investigated, and saw fuel dripping from the vent of one tank. When he removed the cap, gasoline sprayed over his clothing.

As he started around the truck, gasoline vapors reached the pilot light of the water heater in one corner of the wash bay. In the resulting fire and explosion, the dealer was seriously burned and two bays were badly damaged.

The Safety Engineer

(From page 19) safety engineer is one whose engineering knowledge must be very broad. His knowledge of engineering applications must be comprehensive. Is this a case of

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Internal storage tanks and transfer pumps at the raw materials end of a cracking catalyst plant. Safety engineer must make a detailed process flow review with each supervisor periodically to see that plant will continue to operate without accidents.

learning less and less about more and more until he knows nothing about everything? Not at all. It simply means that his interests are wider than are those of the average engineer.

The safety engineer has a management job. He does not have a design specialty, ordinarily. His one fundamental interest, in new designs, is this: he is interested in seeing that a process, article of equipment, or structure can be operated and maintained, with the most complete freedom practical from those "bugs" and inconsistencies which make the production boulevard bumpy by causing "accidents." To me, this means that his interest in good engineering design and construction is only the same as that of any engineer who establishes a very high set of ideals.

If there is such an animal as the top management's triple-threat man for engineering, maintenance, and operation to ensure safe maintenance and operation, it is the safety engineer. While the entire Safety Department is ordinarily responsible for seeing that all practical is done to ensure safe operation, the safety engineer himself is responsible for seeing that safety is incorporated in the design and construction of the facility, so that the plant *can be maintained and operated safely*, and then to ensure the establishment and supervision of systems which will make for a safely maintained and operated plant. In order to be able to tie all of these ends together the safety engineer must, of course, know the maintenance and operating requirements of any new proposed project.

His Position in Management

It is the safety engineer's responsibility to himself and to his organization to develop himself professionally. Everybody in the organization has a right to feel that he can go to the safety engineer with a safety problem and get a specific and satisfactory answer. If the safety engineer has the answer himself, out of his own experience, and he is positive that it is a satisfactory and reliable answer, then of course he will give it. Otherwise, he should pursue all available sources of reference—whether they be of documentary report character, or personal experience character on the part of specialists in various fields.

The safety engineer should maintain an adequate reference library, and should continually build it up on a selective and well-indexed basis. Part of his job, of course, is to review technical releases such as the Bureau of Mines publications, trade publications, professional journals, and other sources. It will be well if he lets his management colleagues know that he is developing this reference file and he should encourage their use of it through him. One suggested method of building up a file is this—to select journals carefully for the most helpful coverage of the industrial fields in which his organization is interested, in the form of technical articles, reports, and advertising. The advertising, incidentally, is quite important. It may be well to review and file these

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journals as they are received, keeping them for 12 months. As he reviews and files the newest issue, the oldest—13 months old—is returned from the file, reviewed again, and worthwhile articles clipped and filed for permanent reference.

The safety engineer should keep on the alert for new items. He should always keep alive to the possibility of their application to the accident problems in his own organization. He should check the experience of others in the new items, or, where such is practical, have them tried out in his own plant or plants. Safety standards should be kept flexible and up to date, at all times.

By his professional mien, by his knowledge and ability, by his spirit of helpfulness and industriousness, by his ability to tackle the problem and see it through to completion, by his ability to *get the answers* with a minimum of fuss and fanfare, the safety engineer should encourage the reliance and cooperation of his colleagues on the management staff. If he follows these tenets, he will get that reliance and cooperation.

It is important to the success of the safety engineer and his job—and therefore to the success of the entire accident prevention program—that the top management of his organization clearly define his responsibilities and functions in published plant policy. This is particularly important, of course, in the case of a new safety engineer at a given plant, or in the instance of a plant which has had a safety engineering position established for the first time. It is not the safety engineer's job to chase the plant engineer to make sure that things do not slip by him. It is the top management's job, by policy publication, to tie the two functions together—plant functional design and plant safety design—so that no engineering job becomes active without the safety engineer's being brought in for thorough review at all steps in the project.

Plant engineers who never have had the occasion, in their experience, to work with the cooperation of competent safety engineers, usually do not know exactly how the safety engineer fits into the design picture. This is completely understandable, and it is a situation which the new safety engineer might reasonably expect in his first contacts with such a plant engineer. However, in almost all cases, the plant engineer's change of attitude, in favor of the assistance of the safety specialist, is most gratifying.

The Safety Engineer and the Design Engineer

Safety engineers are concerned with all fields of engineering, and therefore they do not specialize in one narrow or particular field of engineering design. The specialized field of engineering design belongs with the design engineer himself. Even if the safety engineer were the finest design engineer in the world—

highly competent in all phases of specialized design (which is impossible for any man)—he would not and should not spend his time and effort on the detailed and highly technical aspects of design.

It would not be his province to be concerned about whether the section modulus is adequate in a given member in a given steel structure—whether it would be best in a given installation to design for three large single phase transformers or one three phase transformer—to be concerned about the distance between plates in a column, or specific items of that type. The safety engineer ordinarily does not care what manufacturer's pump is bought, but he does want to have that acid pumped instead of blown. The safety engineer does not care what make of high pressure gauge glass is used on that tank of HCN—but he does know that he will not stand for installation of an ordinary, easily breakable gauge glass. He does not care whether the engineer puts in a safe liquid level control unit in the top of the head tank, or uses a dependable diaphragm switch arrangement on the outside manometer—but he *does* want that liquid level control for protection against an over-delivery. He does not care what brand of flame arrester is specified but he does want to make sure it is adequate for its job, of materials compatible with the atmosphere contacted, and in proper location for safe discharge and for inspection and servicing.

The safety engineer should always keep in mind that the design engineer, while he may be expert in structural design, or in electrical design, or in the determination of heat or material balances, or whatever, perhaps never operated a process of the particular kind under design in his life.

This certainly is no reflection on the design engineer, but it does mean that the safety engineer himself must get acquainted with the fundamental operating and maintenance problems which will be met in the particular process under design. In the new process design, the design engineer and the safety engineer together can make a good team for the production of a good usable, maintainable, safe installation.

One of the important jobs of the safety engineer is cooperation with the plant engineering department in the design of new processes. He should be called in as soon as the preliminary flow sheets are developed. Here are a few suggestions which the safety engineer might like to observe in his follow-through of new flow sheets, new department layouts, department revisions, redesign of processes, etc.:

1. The flow sheets should be reviewed in the company of the engineers concerned with the different parts of the design, the supervisor who will be in charge of operating,

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and the process engineer. The safety engineer should never try to review a job by going over the flow sheets entirely by himself.

2. Remember that, regardless of the complexity of the process, it simply is an elaboration of single standard elements, each of which can first be considered on its own and then in its relation to the rest of the process. Let us use, as an example, one reaction kettle in a proposed process. Some of the things to consider would be these:

Is this an exothermic reaction?
How is temperature controlled?
How are materials added?
How are dry materials added?
How are liquid materials added?
What type of controls?
Any foam-over problem?
Are components or the product flammable or toxic?
Physical size of the vessel
Size of manhole
Is there adequate vertical clearance over the manhole for man removal?
Would the reaction run away if the electrical power on the agitator were lost?
Are drowning or reaction killing methods necessary?
Detail of pressure relief, the size, type, where discharged, etc.

3. Do not get involved in a lot of highly technical detail that is not important from the safety standpoint.

4. Even if you think you know all the answers, do not race ahead of the engineers' explanations. Let them tell you.

5. Have the engineer go over the process once briefly, from beginning to end, to give you a panorama of what it's all about.

6. Then start back in the beginning and get the detail on physical description of each successive processing unit, how raw materials are received, how transferred to process, how they are processed at each stage, transfer methods, temperature and pressure conditions (as related to safety), instrumentation (as related to safety), and so on through the process.

7. Ask the chemical process engineer and operating man what can go wrong from the safety, fire, or explosion standpoints, as they view it. You may be surprised at the many important things they will think of, and note for correction, which the safety engineer might not. They will be able to do this because of their knowledge of the full chemistry of the process, because perhaps they have had extensive, first-hand experience with the general type of process, or because of other values which they have accumulated out of their specialized experience.

8. Review of the points which you think should be revised, and get agreement among the design engineer, process engineer and operating man, as to what shall be done in order to correct them.

9. Make sure all items are covered by notes by the engineer.

10. Apply all of your knowledge of plant operating and maintenance problems in your visualization as to what the accident prevention problems might be in this new or revised process. Use your imagination to the fullest practical degree.

The safety engineer is the plant management's "triple-threat man" for the safety program, as mentioned before. He must know engineering, maintenance, and operation, particularly from the standpoint of the manner in which all three of these phases of industry tie in together. There can be no such thing as a process held from the knowledge of the safety engineer because it is "confidential" or "secret." Such an idea is completely untenable.

Keep Up-to-Date

To keep in touch with operation and the plant changes—and of equal importance—to make sure that the supervisor himself keeps alert to the various little accident pitfalls which can occur in his department, the safety engineer should make a de-

(For further details on advertised products, use the Reader's Inquiry Card on page 115)

tailed process flow review with each operating supervisor at least once each year. The same should be done, of course, at the time of any process change. In making such a survey, a good method is for the safety engineer and the operating supervisor to go through the department or process from beginning to end, following the flow sheet, in careful detail, and making particular note of any changes (no matter how small) and/or possible accident points. Hazardous operations should be re-analyzed, and operating procedures should be reviewed to make sure that they include all the necessary safety instructions. Determination should be made also as to the thoroughness with which the operators know and understand these instructions.

In the safety engineer's review of new process designs, structural designs, and other changes, he should remember that the place in which we usually fall down is the *details*. The process may be worked out expertly, but if we ignore the details, we provide accident possibilities. Some of these "tremendous trifles" are as follows:

- Tankcar unloading and loading facilities
- Storage tank gauging methods
- Access to high or low points for operator observation, checking, etc.
- Sampling methods
- Valve accessibility
- Handling of raw materials in process and charging methods—bags, drums, etc.
- Liquid transfer controls
- Liquid level controls

All of the before-mentioned is in the interest of creating not just a good chemical process, but a chemical process plant which can be maintained and operated smoothly and efficiently, without those unnecessary oversights or ragged edges which can cause "accidents."

(To be continued in the November issue.)

From an address presented at the 1952 Central States Safety Conference. Pictures by courtesy of American Cyanamid Co.

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NEOPRENE COATED
WORK GLOVES
FULLY CURVED FINGERS

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THIS POPULAR KNITWRIST STYLE IS BUT ONE OF SEVERAL OFFERED BY GRANET.

RESISTANT TO OIL, GREASE, CHEMICALS, SOLVENTS

DIRT-PROOF AND WATER-PROOF

Increase your production — decrease your glove costs with Granet Neoprene-Coated work gloves . . . the fully curved finger gloves . . . scientifically designed for your Safety, Protection and Comfort. Completely water-proof and dirt-proof. Made to resist oil, grease, solvents and chemicals. *Granet* work gloves wear longer and fit better. *Granet* quality and durability are unsurpassed. Send for samples today and WEAR-TEST them yourself.

THE GRANET CORP.

25 LORING DRIVE

FRAMINGHAM, MASSACHUSETTS

(For further details, use the Reader's Inquiry Card on page 115)

Imagine the Hazard

(Continued from page 63)

alert, and is a part of every skilled driver's safety I. Q. "Imagine the Hazard," says the Institute, is played like this:

As you approach a line of parked cars, imagine that a child or pedestrian may step from between those cars, or that one of the cars may back into your path. If you plan to pass another car, on a hill or a curve, or at an intersection, scare yourself into staying in line by imagining that another car may be approaching from around the curve or over the hill, or coming out of the side road. When approaching a school or play area, imagine that children may run into the street. When approaching any oncoming vehicle, imagine that the driver may not stay on his side of the road. Imagine that over the next hill or around the next curve the road may be blocked by an accident or other situation.

These are only a few examples where "Imagine the Hazard" may help to avoid a tragic accident. Other similiar situations will occur to drivers.

The result of this type of thinking while driving is clear. It will automatically cause the driver to adjust his driving actions to fit safety into all highway and traffic conditions.

Dealers Furnish Cars for Training of High School Drivers

MORE than 6,000 cars, valued at 12 million dollars, were provided to high schools by new car dealers for driver training during the last school year, the Inter-Industry Highway Safety Committee announced recently. This was an increase of 300 cars over the previous year's total.

"This contribution has greatly facilitated the rapid growth of high school driver education and is tangible evidence of the constructive support being given to highway safety programs by public-spirited automobile dealers," said W. F. Hufstader, Chairman of the Committee and a Vice President of General Motors.

"Authorities agree that high school driver education offers one of the major hopes for greater traffic safety," said Mr. Hufstader. "Development of skill and proper attitudes in youngsters when they first take the wheel is imperative if we are to have a nation of competent drivers and reduce the appalling toll of accidents involving those in the 15 to 24 year age group.

"Last year, one out of five persons killed on the highway was in this age group. In addition to the 7,800 killed, 360,000 were injured, according to National Safety Council figures. State studies indicate that driver education cuts the accident rate of trained drivers in half and reduces fatalities even more."

Mr. Hufstader also announced that the Committee, in cooperation with the National Automobile Dealers Association, has created a

new highway safety award for presentation to dealers who provide cars to high schools for behind-the-wheel training. First awards will be made this fall at dealer conventions and civic meetings throughout the country.

What's Ahead on the Highways

A REALISTIC look into the future of U. S. traffic conditions and highway casualties was given the nation by Thomas N. Boate, accident prevention department manager of the Association of Casualty and Surety Companies, who predicted that unless a public awakening to the growing menace of automobile accidents to personal safety makes it "a first rate political issue," there will be twice as many accidents and injuries and a 50 percent increase in traffic deaths by 1967.

Projecting rates of increases since the end of World War II into the next 15 years, Mr. Boate told the 31st annual Massachusetts Safety Conference that by 1967 the nation would have 107,200,000 licensed drivers and a total of 16,700,000 automobile accidents in a one-year period. He also estimated that a total of 56,000 persons will be killed in 1965 as a result of traffic accidents, an increase of 19,000 over the 1951 figure, which already has risen 9,000 over the 1945 highway death toll, unless the "rapid deterioration of highway safety in recent years" is reversed.

"Notwithstanding all of the knowledge and all the fine techniques that have been developed," said Mr. Boate, "the traffic accident experience in this country will continue to grow in frequency and severity until much stronger leadership is applied to the safety movement than has heretofore been the case.

"The most important undertaking confronting those of us who devote our lives to highway safety is the achievement of a public awakening that will resolve the motor vehicle accident experience into a first rate political issue on which candidates for public office will be compelled to commit themselves. This implies a situation in which there is constant urging on the part of recognized leaders for adoption of needed reforms in traffic safety. This is a task of no mean proportions, the accomplishment of which is long overdue."

Public Apathy

Public apathy remains unchanged while motor vehicle accidents continue to increase in number and severity, Mr. Boate told the statewide safety conference. Lack of understanding of the motor vehicle accident problem and its solution by responsible officials of state and

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SAFETY FLOOR FINISH
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You can depend upon Con-Sol Products for every maintenance problem — cleaning, insect or bacteria control, floor upkeep, health and safety.

Write Con-Sol technicians without obligation, about any specific health hazard or unusual condition in your plant. Many years of experience and over a hundred industrial housekeeping products are available to solve your every maintenance need.

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Skidproof gives any type of floor — wood, linoleum, rubber, asphalt, tile or terrazzo — a hard, durable slip-proof surface that protects against the toughest kind of wear. It's easy to apply, easy to clean. It's quick-drying, odorless, economical — one gallon covers 2000 square feet!

Skidproof overcomes the slipping hazards of ordinary wax — makes rubber burns, stains and surface damage easy to get off — won't crack or check — won't discolor any floor surface. It's the finest surface finish available to keep floors shining, beautiful and safe!

Tested and approved by Underwriters Laboratories

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Exposuritis

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the industrial evil that

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THEN WHY TAKE IT FOR GRANTED that a certain portion of man-hours must be sacrificed to the dispensary or the sick bed because of *exposure* to industrial hazards — and the *absenteeism* that follows?

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Inquire *today* into the MILBURN METHOD for Plant Safety! A Free Survey of your industrial operation that will show how you can better your working conditions, and increase your profits.

THE MILBURN COMPANY

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municipal government "continue static," he declared, "which is merely a reflection of public indifference." Together with the rapid increase in the number and use of motor vehicles, he added, these are the fundamental reasons for the rapid deterioration of highway safety in recent years.

"Traffic accident prevention is a long-range undertaking, the essence of which is public education," said Mr. Boate. "The objective of public education and traffic safety is necessarily the production of an entirely new kind of driver. This is a big undertaking. We have barely made a start. It implies the joining of forces of all the major industries concerned with the problem, with the backing of representative groups from all agencies of our society."

Mr. Boate outlined the following "most apparent needs" of the moment to achieve greater highway safety:

Tightening up of traffic laws where needed.

Enactment of reasonable but absolute top speed limits and their strict enforcement.

Complete uniformity of traffic laws and regulations as between states and municipalities.

Complete reorganization of state and municipal police departments, with procurement of adequate personnel and facilities necessary to the proper control of highway traffic.

Impartial enforcement of traffic laws and regulations, with "great emphasis" on suspension of driving privileges as a penalty flowing from law violations and accident involvement.

Suspension of driving privileges on first conviction for violation of speed laws.

Uncompromising accident investigation by police, with a view toward punishment of offenders.

Appropriate regulation of pedestrian traffic.

Greater use of traffic engineering in regulating movement of vehicular and pedestrian traffic.

A stiff examination of persons applying for operator's license, with unconditional refusal to license the unqualified.

A "clinical examination" of accident repeaters and chronic law violators with institution of corrective measures or withdrawal of operating privileges.

State-wide periodic inspection of the safety factors of all motor vehicles.

Mr. Boate described the long range needs as follows: a realistic highway improvement program; elimination of highway hazards through traffic engineering; high quality driver education courses for all students in all high schools, and adult driver education by state and municipal government, in cooperation with appropriate civic groups, on a continuing basis and utilizing all publicity media.

Highway Boors

DRIVERS who have operated a car for 10 years or longer without an accident have an important thing in common. They are courteous and considerate of others who use the highway.

An analysis for the Institute for Safer Living shows that in more than two-thirds of all traffic accidents involving fatalities, a discourteous act was the factor principally responsible for the accident. Discourteous driving in one form or another accounts for an estimated 25,000 motor vehicle deaths each year.

The Institute holds that disregard of the rights and well-being of others on the highway is discourtesy. Safe driving principles and practices are designed to protect motorists and their property. Therefore disregard of these practices is discourtesy. For example, the driver who weaves in and out of traffic is just as discourteous as a pedestrian who shoulders his way along a crowded street forcing others to side-step him or risk being jabbed with an elbow. However, shouldering ones way through motor vehicle traffic is much more dangerous. A pedestrian may

risk getting a smash on the chin by an irate person's fist. But the weaving driver is risking an impact with some 3,000 pounds of unyielding steel.

The following are listed by the Institute as being the most common acts of driving discourtesy, and ones which most frequently lead to injury or death: 1. Driving at excessive speed or exceeding lawful speed limits, 2. Passing on hills or curves, 3. Following other cars too closely, 4. Hogging the road, 5. Making turns from the wrong traffic lane, 6. Driving after drinking, 7. Failure to dim lights for other drivers, 8. Ignoring the right of way or insisting on right of way, 9. Weaving in and out of traffic, 10. Double parking, 11. Refusing to wait for pedestrians crossing the street, 12. Blocking pedestrian crosswalk while waiting for traffic lights, 13. Trying to bluff other drivers, 14. Failure to use horn for warning other drivers, 15. Failure to give proper hand or directional signals.

If more motorists would look upon these unsafe acts in terms of downright bad manners, many would hesitate to commit them. The same courtesy used at home, at social gatherings, or in public is certainly even more important behind the wheel. When driving, courtesy is a matter of life and death.

First Aid for Slivers

THE lowly splinter ranks as one of the most common annoyances of mankind. It is forever jabbing itself into an unsuspecting finger, hand, or toe, and imbedding itself in such a way that it defies any but the most patient efforts to remove it.

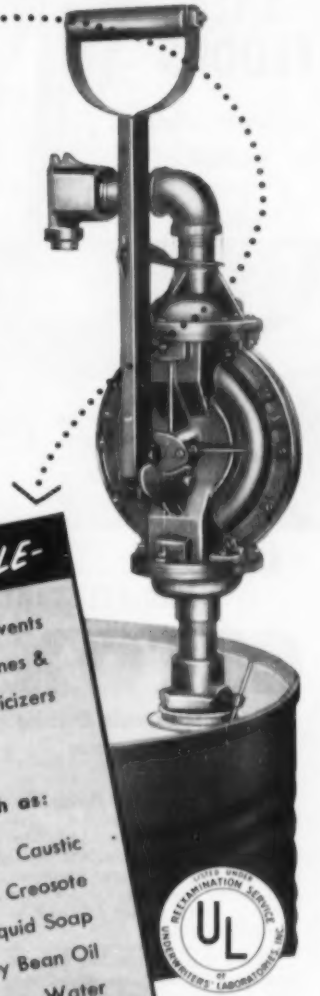
Fortunately, most splinters, slivers, thorns, and similar foreign bodies cause few serious consequences, aside from the pain and annoyance involved. Ever present, however, is the danger that the splinter wound may become infected. Many cases of the more seri-

(Continued bottom next page)

A superior transfer pump

for HARD-to-HANDLE LIQUIDS

Do you have a liquid handling problem that a good hand pump could solve? This Tokheim DOUBLE ACTION barrel pump with optional diaphragm and body may be the answer. FAST—it will deliver 20 gallons per minute of most liquids. HIGH VACUUM—it will lift gasoline 20 feet. ADAPTABLE—it will handle a wide range of liquids, and is supplied with hose or spout outlets for drums, skid tanks or underground installations. Compare the list below with your present needs; then call your dealer, your Tokheim representative, or write the factory for literature.



A TOKHEIM WILL HANDLE-

Acetates, Alcohols, Aromatic Solvents, Chlorinated Solvents, Glycols, Ketones & Ethers, Petroleum Solvents, Plasticizers, Petroleum Products

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Ammonia, Anti-Freezes, Castor Oil, Caustic Soda Solution, China Wood Oil, Creosote, Freon, Glycerine, Linseed Oil, Liquid Soap, Pine Oil, Pine Tar Oil, Soy Bean Oil, Styrene, Tung Oil, Turpentine, Water

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(For details, use the Reader's Inquiry Card on page 115)

• SUPER-SAFE
• MAR-RESISTANT

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Hydraoxated Carnauba Dressing
for all floor surfaces

CETOX contains chemically hydraoxated Carnauba. No abrasives or silicas added. The slip is out. Its dazzling self-lustre, tough to mar qualities, and safety under foot are amazing . . . even under tracked in or spilled water.

Make the all-weather CETOX test. Put CETOX on *your* floor. See how it withstands heavy, abrasive foot traffic—throughout rain and shine. Get Super Safe CETOX for your floors.

Listed by Underwriters' Laboratories, Inc. as anti-slip floor treatment material.

Approved by York Research Corp. for the American Hotel Assoc.

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Products Co.
HOWARD & WEST STREETS
BALTIMORE 30, MARYLAND

A Spot for Safety

If employees do not know where emergency fire and safety equipment is, how can they use it? Give emergency equipment a spot of its own, where everyone can find it.

A CENTRAL safety station, first in the company's history and one of the first in industry in the U. S., has been installed at General Electric Company's chemical materials plant in Schenectady.

The station groups all major safety devices for each section in one large, convenient and extra-visible place, in contrast with older arrangements in which the safety equipment was spotted at many different, hard-to-remember locations.

As rapidly as possible, six to eight more of these central stations will be established in the plant. Similar stations are planned for GE's Coshocton (O.) plant, and other plants of the company's Chemical Division will "have their safety gear so arranged as rapidly as safety engineers can determine the most logical places" for centralized safety stations, a GE announcement reports.

With their bright backgrounds, painted safety green, and the white-and-red equipment boxes, the stations will be clearly visible from a distance.

In the Schenectady central safety station the equipment and supplies were selected to meet practically any

emergency. They include a bottle of wash for caustic, together with sterile gauze application pads; a universal gas mask; a collapsible stretcher; a treated fire blanket; an asbestos suit; two sets of self-generating oxygen apparatus, for use in oxygen-deficient atmospheres; and a hand fire extinguisher.

Large signs and lettering identify the station and each equipment box so that even a brand-new man in the plant could quickly locate the safety gear in an emergency.

Picture by courtesy of Mine Safety Appliances Co.

(Continued from page 77)

ous infections such as tetanus and blood poisoning have developed as a result of tiny slivers which have carried bacteria under the skin.

It is always advisable to remove a splinter immediately after it enters the skin. Removal is best performed by the person who knows the "tricks of the trade," as well as when, and when not, to attempt the operation. Here are some suggestions compiled by the Institute for Safer Living.

Attempt to remove only superficial or easily reached foreign bodies from the flesh. All deeply-imbedded splinters or other foreign bodies should be removed by a doctor. Use small sterilized forceps or tweezers if possible. If a needle or similar sharp instrument is used, be sure to sterilize the instrument by holding it over a match flame. Use promptly after sterilizing.

Wash the adjacent skin with soap and water and apply antiseptic before you tackle the splinter. One method is to soak the hand or foot in a warm salt water solution (one teaspoon of salt in one pint of warm water) from twenty to thirty minutes. This tends to bleach the skin and make the foreign body readily

(For further details on advertised products, use the Reader's Inquiry Card on page 115)

visible. In some cases it may help to draw the foreign body to the surface of the skin, making it easier to reach.

Lift or press a splinter out *in the reverse direction of the penetration.* Do not attempt to dig the flesh or skin away from it. If a splinter is broken while being removed, have a doctor remove the remaining imbedded part at once!

Remember that the two main objectives in removing a splinter are to keep the wound clean and free from contamination and to avoid further damaging of the tissues. Unless this can be done safely, it's best to leave the removal to a doctor. A small sterile dressing should be applied until the wound heals.

Eye Protection Group Expands Industrial Program

THE National Society for the Prevention of Blindness has announced the appointment of James O'Neil as Director of Industrial Relations.

Mr. O'Neil will carry on the National Society's expanded program of service to industry in the cause of sight conservation. In announcing the appointment, Dr. Franklin M. Foote, Executive Director of the Society, stressed the urgency of reducing the 300,000 eye injuries—most of them preventable—that occur every year in American industry.

Since 1948 Mr. O'Neil had been associated with the Pyrene Manufacturing Company of Newark, N. J. Prior to that he served as production manager for the E. W. Bliss Company of Brooklyn. He has also been associated with the George Scher Engineering Company as a methods engineer, working in the Wright Aeronautical Corporation plant.

What's New?
See pages 112–114

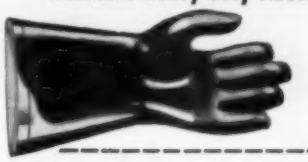
6 major improvements in Edmont gloves

to fit your job requirements

New flexible NEOX (reinforced neoprene) coating gives firm, easy grip

Never before a chemical and wear-resistant coated glove with such flexibility and grip. Far superior to ordinary neoprene. Most widely applicable of all coated work gloves.

Redmont heavy-duty NEOX gloves have improved safety-grip finish



Finish cured into 30% thicker NEOX coating. Won't chip or peel. Safest glove made. Seamless wearing surface, extra-wide thumb span, curved fingers.

New Grappler plastic gloves far outwear leather, other plastics

Coated with DUROX, 50% longer wearing, *non-slip* plastic, and made in new wing thumb, pre-flexed finger pattern that perfectly fits the hand.

Hand-fitting Monkey Grips with flexible plastic coating

Second only to Grapplers for long wear and made in same pattern. Fits the hand all over; no bagginess; comfortable grip.

New white Sani-Gluv meets special sanitation requirements

Liquid-proof all-white plastic coating in new hand-fitting pattern with wing thumb and pre-flexed fingers.

Improved white-fabric-lined Grab-its, approved by safety directors

Long-wearing, sure-gripping rough finished natural rubber, bonded to new and sturdier white fabric.

Test these gloves at our expense: Send brief description (on business letterhead) of your operations, materials handled and temperature condition. Without cost, we will forward samples of the type gloves we recommend for testing on-the-job. Address

Edmont Manufacturing Company., 1256 Walnut Street, Coshocton, Ohio

World's largest maker of coated industrial gloves

Edmont job-fitted gloves

(For details, use the Reader's Inquiry Card on page 115)

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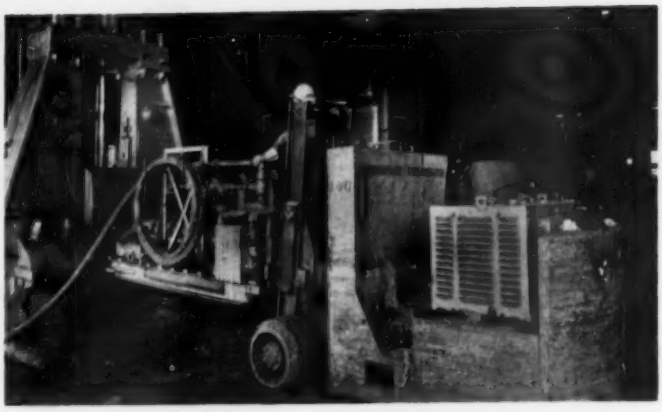
SAFETY MAINTENANCE & PRODUCTION Salutes a Safety Idea for OCTOBER



A Key to Safe Key-Driving

AN AIR compressor unit carried on the forks of one of its fork trucks makes die key driving easy for a large midwestern auto manufacturer.

In the manufacturer's forge shop, a compressor was mounted on a platform carried on the forks of a 12,000 lb. fork truck. The truck operator drives up to a forging hammer, raises his forks to the right level, then gets off the truck and pulls a lever to propel the key-driving ram.

Formerly a crew of five laborers jockeyed a 6 ft. steel ram into position to drive the keys home. The ram was carried in a cable sling by an overhead crane. As the workers guided it, the crane operator swung the ram into the key. That's tricky business. Shop foremen knew it could lead to smashed fingers or serious damage to the expensive dies.

Now the fork truck is used full-time on key driving jobs. It takes all the risk out of the work, and at the same time releases the five laborers for production assignments.

Picture by courtesy of Baker-Raulang Co.

Air Control

(From page 38) presents a problem more from the standpoint of practicality rather than a health or property hazard. The alkaline cleaning solutions and most rinse waters from them can be run through the usual connections without injury to the drains. However, spent acid dips and acidic plating solutions and the rinse water used in connection with them may present some difficult problems for a plating shop or department being operated in a metropolitan area.

Commercial scavengers frequently may be the answer to the problem of disposal of spent plating solutions. They of course must have a procedure of ultimate disposal which meets with the approval of authorities and which does not result in the creation of a nuisance or health hazards elsewhere.

The advent of pollution control programs which are being carried out on local and nationwide scales has made the disposal of spent solutions and even of rinse waters a matter of complexity and difficulty for many plating shops.

In general, pre-treatment of plat-

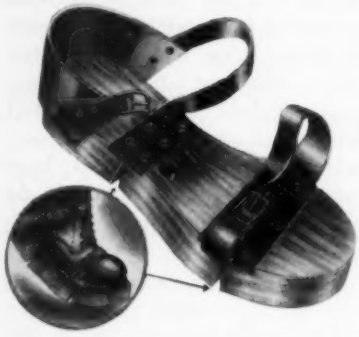
I KNOW I'M SAFE... with WOODEN SOLES!

... they Insulate

...FOR THE FOUNDRY

No. 351—An improved **Reece "Hot Foot" Sandal** with two strong sole leather hinges provides real insulation for those hot jobs. Straps on quickly over any shoe.

Sizes—Small-Medium-Large.



REECE ORTHOPEDIC SHOE
No. X175-CG-Men's No. X173-CG-Women's
for
BROKEN FOOT BONES— CRUSHED TOES

Wood Sole with Airfoam insole acts as splint. Keeps injured foot immobile—reduces lost time accidents. Fits over bandages. Easily stocked, no rights—no lefts.

Sizes—Small-Medium-Large.
Available without foot guard.

STRONG STEEL TOE

No. 504-S—Double duty for safety with this **Reece "Perfect Rocker" Wooden Sole and Steel Toe Shoe** . . . made with durable leather uppers. Keeps the feet at body temperature regardless of room or floor conditions.

No. 7704-S—Acidproof Shoe—same as above with **Neoprene Uppers** . . . unusually light weight protection.

See these and many other styles at Booth 115

REECE WOODEN SOLE SHOE CO.

There is no substitute for Reece Wooden Soles

DEPT. SM&P 10 **COLUMBUS, NEBRASKA**

(For further details, use the Reader's Inquiry Card on page 115)

ing wastes is required before they can be discharged into municipal sewers. This may not be true if the plant is small and the domestic sewage flow large, and if the concentrated wastes are disposed of in some other manner, and if the flow of dilute wastes is uniform and steady.

Metal finishing wastes have been known to have affected adversely sewerage systems and sewage treatment processes. Most sewage treatment procedures are based on biological action and it has been established that cyanides and some metallic ions such as copper and hexavalent chromium interfere with the settling and digestion processes which are employed in the treatment of sewage.

The metal plating industry is making rapid progress in solving its pollution problems, and is one of the leaders in the study and solving of these problems. The American Electroplaters' Society disseminates information on problems of the industry to its members, and is budgeting a substantial sum annually for research on waste disposal.

Pictures by courtesy of Oakite Products, Inc. Two photographs of Crown City Plating Co., Pasadena, Calif.

From an address presented at the 21st Annual Greater New York Safety Convention.

ABC's of Fire Extinguishers

(From page 24) for use on Class B and C fire. To apply, unhook the hose, pull out the lock pin and operate the lever or trigger as indicated. Discharge into the fire.

The dry chemical extinguisher must be kept filled to the specified weight. Before recharging, the hose or nozzle should be cleared of all chemicals since dry chemical, outside the protection of airtight cylinders, may cake in a damp atmosphere.

In the case of the small dry chemical units a loss of ½ ounce for a 15 pound extinguisher or a loss of 1 ounce for the 25 pound type indicates the need for cartridge replacement. Compound refills must be kept sealed and in recharging, care must be taken to see that the compound does not become contaminated by foreign matter. At least once a year inspect these extinguishers for deterioration or damage.

American industry today is sustaining an unprecedented annual fire loss. Like any enemy, fire levels its most extensive damage when its victim is unprepared. Keep one step ahead of fire by being prepared—with approved extinguishers! And remember—lack of proper maintenance due to carelessness or neglect can render an extinguisher as ineffective as a rifle without ammunition.

Picture credits.

Page 20: Top—Ansul Chemical Co.; Two lower pictures—Stop Fire, Inc.; Page 21—American LaFrance Foamite Corp.

LISTEN CURLEY... THAT'S ONE EXTINGUISHER YA' DON'T HAVE TO WORRY ABOUT GETTING WET!

That's right! Ansul Dry Chemical Fire Extinguishers are Water-tight. Thousands of Ansul Extinguishers stand guard over difficult fire hazards in locations where the extinguisher cannot be protected from the weather.

For installations where extinguishers cannot be pampered with expensive shelters, water-tight construction is essential for dependable fire protection. That's one reason you see so many more Ansul Dry Chemical Fire Extinguishers in outdoor locations protecting all sorts of tough hazards associated with the petroleum industry.

SEE PAGE 18
(Advertisement)

Elevator Accidents Analyzed in Report

MORE than half the serious and fatal accidents which occurred in connection with freight elevators during 1949 and 1950 could have been prevented by adequate safety devices which are available and required by elevator codes, it is indicated by the fourth Accident Report recently published by the Otis Elevator Company. A statistical analysis of 1674 accidents reported during the two-year period, the Accident Report also includes practical data on the causes of accidents on passenger elevators, moving stairways, automatic elevators and dumbwaiters.

Compiled by Gavin Watson, Assistant to the Chief Engineer of Otis Elevator, the analysis covers accidents on all types and makes of vertical transportation equipment installed in commercial, industrial, business, institutional and residential buildings. All the accidents were reported, from personal investigation whenever possible, by company representatives throughout the country. Although the percentage of total accidents covered in the Accident Report cannot be accurately determined, the types and causes of accidents reported are considered sufficiently representative to indicate conditions needing the most attention.

To aid evaluation of the Accident Report, the only published analysis of vertical transportation accidents, all accidents are reported as either minor, serious or fatal. Minor accidents include mild shock and bruises and, in the case of moving stairways, torn clothing. A large proportion of minor accidents do not involve bodily injury.

Few Accidents In Cars

During the two-year period, less than 15% of all accidents on passenger and freight elevators occurred in or on the car itself, either while in motion from floor to floor, or resting at a landing. On the other hand, the Accident Report finds that "approximately 80% of all elevator accidents take place at the hoistway and car entrances." This type of accident occurs frequently on older elevators equipped with inadequate or worn safety devices. The installation of modern protective equipment as a part of elevator modernization is rapidly reducing the number of such accidents.

Many serious and fatal accidents involving persons who opened the hoistway door and fell down the hoistway occurred because the doors were operated by unauthorized emergency keys or with coat hangers, screw drivers, and other simple tools. Emergency door unlocking devices, which are dangerous and unnecessary when used for other than emergency purposes, are still used with a large number of older elevators. The Accident Report states, how-

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(1) Providing Safety for Machines, Point of Operation Lighting, First Aid and Magnifiers also Eliminating Dust Conditions.

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ever, that "emergency door keys have been prohibited for many years in some localities with a marked improvement in safety, and more and more codes and jurisdictions are banning their use."

In addition to persons falling down hoistways after opening the hoistway door, 100 accidents were reported in which people were struck or caught by a hoistway door or gate and 20 accidents occurred when persons were caught between the car and the hoistway door frame. These cases and others investigated "accent the necessity for adequate and foolproof mechanical and electrical safety devices on hoistway doors or car doors and gates."

Of all accidents reported on both passenger and freight elevators, 231 or 30.3% in the two years surveyed occurred at the car entrance. The lack of a car or car-gate contact was responsible for 88 or 33% of car entrance accidents, 73 of which were classified as either serious or fatal. Although most local elevator codes require proper car door and gate protection, it is clear that substantial improvements can be obtained in this direction.

In 1949 and 1950, 42% of the accidents in or on the elevator car occurred because of a lack of car safety, failure of the car safety to function, application of the car safety and striking of bumpers or overhead.

Automatic Elevators

The 91 accidents reported in connection with automatic (self-service) elevators represent only 11.9% of the total elevator accidents and 29 of these were either serious or fatal. Almost 40% of the accidents in automatic elevators, most of which provide passenger service in apartment houses and professional buildings, occurred when persons either tripped or fell getting on or off the elevator car. In other accidents, for example, persons were struck by closing doors and by a projection in the hoistway when an arm or leg was thrust outside the car gate when in motion.

Scrape off hard-caked grease and dirt ...scrub away dangerously slippery oil with this one powerful HILD Floor Machine! With Power-Scraper attachment the Hild Machine breaks up packed grease deposits...saves hours of tedious chipping away with a hand-spud. And, it's *so much easier* on your floors. No danger of marring the surface or of loosening wood blocks. To remove oil film or slippery grease, use the HILD Machine as a Shower-feed Scrubber. It's equally speedy and thorough in open areas and in the "danger spots"... around, beneath and between machines. Use the same versatile Hild Machine for office floors also...to wax, polish, buff, sand, grind or steel-wool floors of all kinds.

Only HILD has the Shower-feed Brush
Diagram shows how cleaning solution flows from tank on handle through accurately spaced holes penetrating brush back between each row of bristles ... for thorough scrubbing with utmost economy.
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Moving Stairway Accidents

The 899 moving-stairway accidents reported in the two-year period are believed to represent a much higher percentage of total accidents on moving stairways than the cases reported for elevators because of the accurate records kept by department stores, which use a large proportion of this type of equipment. Minor accidents, such as most falls and catching feet between steps and skirt panel, accounted for 93% of the moving stairway accidents, while none was fatal. More people fell getting off than getting on moving stairways. There was no indication that higher speeds meant a much greater chance of accidents.

Free Bulletins & Catalogs are reviewed on page 115

Learning the hard way

HIP POCKET SAG

YOU see it all the time, but it is a dangerous practice. What is it? Carrying hand tools in the pockets, especially the hip pockets. As a "for instance," take the case of an electrician who was talking to his foreman. The electrician's helper walked by with a screw driver sticking out of his pocket. The tool struck and scratched the electrician's arm. Screw drivers and similar tools should be carried in a tool belt.

KICK BACK

THIS worker was trimming a narrow strip from a board, using a table top saw. The piece of wood kicked back, striking the worker and penetrating his abdomen. Rip and cut-off saws should be guarded and equipped with splitter and kick-back devices. There are also certain types of circular saws which are designed to minimize the possibility of kick-back; and there are plenty of safety clothing manufacturers who carry a line of protective aprons that prevent injury to the body if sawed material kicks back.

THE VAPOR TRAIL

AN EMPLOYEE was slightly injured and minor fire damage resulted when a barrel of paint thinner exploded. Investigation revealed that the thinner had leaked from the bottom of the barrel and had seeped down through the floor to a water heater in a cafeteria below. When the vapor from the thinner ignited, flames traveled back to the second floor and the barrel exploded. An alert employee immediately sounded a fire alarm provided by a central station service organization. Firemen were able to extinguish the fire promptly. Although the fire damage was slight, the accident points up the need for safe storage of flammable materials and for frequent inspection of containers.

UNNECESSARY INJURY DEPARTMENT NON-SAFETY SHOE DIV.

BY THIS time everyone, including management, the safety department and the worker, should know that there is such a thing as safety shoes and that they are easily available, inexpensive, and just as comfortable and attractive as ordinary shoes. Apparently, however, the good word still hasn't reached everybody, because there are still daily reports about toe injuries which could have been prevented by simply wearing steel-toe shoes. One recent accident involved a worker who was removing a screen from a cleaning tank. The man's gloves were soapy and as he lifted the screen out, it slipped from his grasp. The screen fell on his foot, breaking a toe.

QUICK DELIVERY

IT HAPPENED during a pipe laying operation. One of the workmen was in the bottom of the trench, 20 feet deep, into which a section of large pipe had just been placed. He called for a block of wood which was thrown down to him. The worker, however, walked into the path of the falling piece of wood and was struck on the head. His skull was fractured. When materials or tools are to be transferred from one working level to another, they should always be lowered or raised by means of a rope—never thrown. And what about some safety hats!

TURKISH BATH

THE water bath on an extruder was heated by introducing steam through an ordinary flexible hose. The tank had been filled with water and was being heated with steam, and the extruder had been cleared prior to a color change. When the next color was ready to be run, the bath required more heat. The operator opened the steam valve. When the water did not seem to be heating, he opened the valve further and the hose flew up, shooting steam into his face.

The operator had been warned about heating the water with a flexible hose, a procedure that is considered poor practice. Even so, the operator should have fastened the hose and also should have worn face and eye protective equipment.

LEARNING THE RIGHT WAY

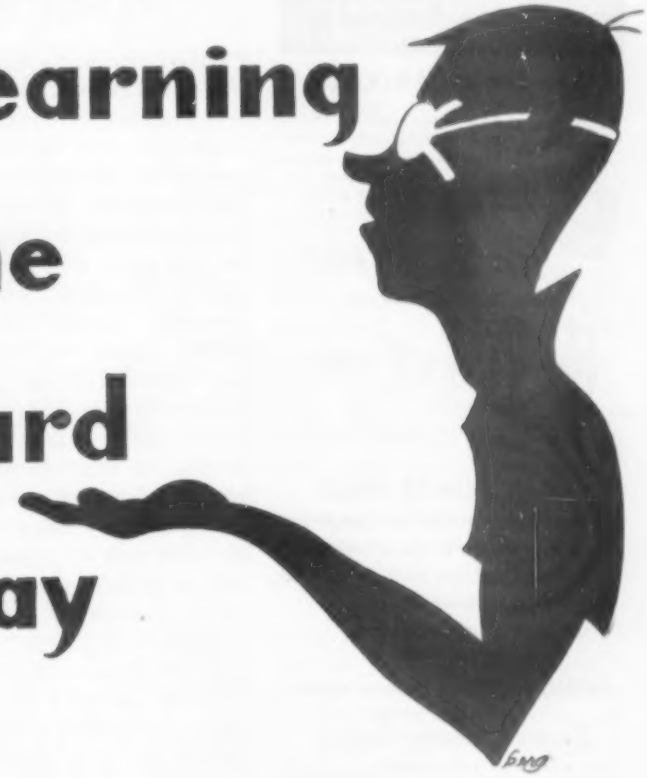
IN THE belief that stories about accidents that didn't happen are just as newsworthy as the wipe-up-the-blood variety, the following case points up what foresight and safety-awareness can accomplish. A safety engineer was making an inspection of a large vehicle-maintenance shop and noticed that there was no guard of any kind for tire inflating operations. He recommended that a steel basket or cage be constructed to hold the tire and rim during the inflation period. The company had never had any tire inflation accidents, but the guard was installed as recommended. Just two days later when an employee inflated a tube, the rim flew off, knocked the employee across the room and broke two of the steel bars on the guard itself. The workman suffered only minor bruises instead of the serious injuries that certainly would have been sustained had the guard not been installed.

KEEP ALERT TO STAY ALIVE

A WORKER for a company making large industrial belts was working with a crew on a table

building up short and miscellaneous belts which require several passes over the table. The belt on the table had been run through and was being taken back to the rear wind-up to be run through again. The belt was started on the wind-up and was running at high speed. The worker, for some reason he himself could not explain, caught hold of the belt close to the wind-up. His right arm was pulled into the revolving roll. Another worker stopped the machine instantly by pushing the safety button. However, the worker received compound fractures of the upper arm and fractures of the forearm.

Learning the hard way



You are cordially invited
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of our engineering staff during the
40th National Safety Congress
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EYE SHORTAGE

THIS may not be new news, but it is a fact that there are no spare eyes available. Everyone will have to get along with his first and only pair for the duration of his lifetime. This particular shortage has been evident for years, but something can be done about it by simply protecting the eyes already available. Eye protection includes not only the obvious hazards from flying particles and harmful rays but also the less hazardous jobs where eye injuries would seem to be only remote possibilities. In fact, eye protection is necessary for practically every industrial worker, no matter what his job is. Even such a routine job as driving or pulling nails requires protective eyewear. For example, an employee was pulling nails from a side wall with a wrecking bar. A nail broke off and struck him in the eye, which was so deeply lacerated that the eye had to be removed.

Rules for Training Truck Operators

THE cost of NOT training industrial truck drivers is many times the price of a proper program of instruction.

According to J. L. Van Cara, driver-training expert of the Automatic Transportation Company, Chicago, current training of industrial truck drivers, except in the largest firms, is poor. "It's so bad," he asserted, "that it costs industry millions of man-hours every year."

He acknowledged that licensing drivers is a too-ambitious project, and said that he'd compromise for sound training programs, based on proven procedures that apply equally well to teaching individual drivers or whole classes.

Power Truck Driver Instruction

The first step is to insist that the manufacturer's representative be around to explain and demonstrate its characteristics when the truck is installed. Before he ever gets onto the truck, the fledgling operator should understand its functions, abilities, limitations, and capacity. He should know where the controls are and how they work. Only then should he get on the vehicle.

When Van Cara installs a truck he makes sure the driver is aware that it is not in all ways like an automobile. He reminds him that the load in front makes a big difference in judging distance and speed, and in visibility; explains that when there is no load in front, the counterweight at the rear makes a big difference in handling the unit.

He proposes that drivers be instructed over a three-day period, the first day of which is largely spent in practicing alone with an unloaded truck. During this day's "laboratory class," the trainee will learn controls, speeds, and smoothness of operating. The next day he will begin to use a typical load, and gradually will begin working into the area

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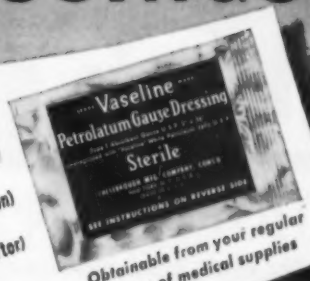

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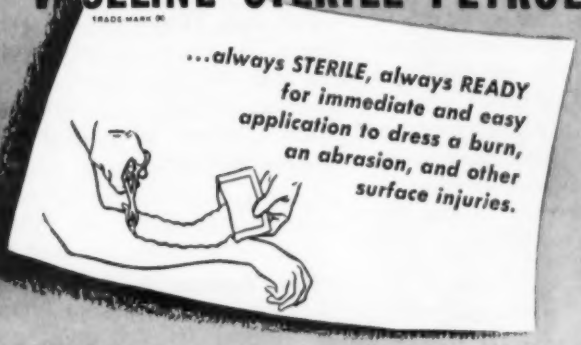

have been adopted by surgeons as standard procedure, by nurses as preferred matériel, by professionally-trained aid personnel as the compact, ready-made, ready-to-apply dressing of their choice.

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where he will be assigned. He'll learn traffic problems, the speed at which he'll work, and where he picks up and delivers loads. Also, he'll get the feel of working in the limited space of storage bays, as compared to the relatively spacious dimensions of most practice areas. The third day he'll be on his own, most of the time, and before his shift is over he should be at ease with the truck.

17 Point Safety Code

1. Keep the body inside running line of the truck.
2. No passengers should be permitted to ride on the trucks.
3. Keep to right of aisles whenever possible.
4. Slow down when vision is obstructed.
5. Stop at doors, corners, exits, etc., and sound horn.
6. Use horn when approaching pedestrians.
7. Start, stop, or turn gently, not suddenly.
8. Face in the direction of travel always. Before backing up, look in the direction you will go.
9. Carry only loads for which the truck is meant.
10. Keep loads below eye level, carrying them just clear of the floor. If the load blocks vision, it should be trailed except on sit-down model trucks (a problem which can be avoided by selection of the correct truck for the load).
11. Never drive high-lift trucks with platform or forks elevated.
12. Bent or damaged loading plates should not be used.
13. Reverse controls are not a substitute for brakes.
14. Driving with wet or greasy hands is dangerous, because it can cause the operator to lose control of the wheel.
15. Slow down for wet or slippery floors.
16. Stunt driving and horseplay should be eliminated.
17. Trucks should be returned to the charging station or parking area at the end of the shift.

Words of Caution

Van Cara warned against drivers operating types of vehicles with which they are not familiar. "Recent years have produced a vast number of different types of industrial trucks, with a large number of new operating and control features," he pointed out. "A driver unfamiliar with recent engineering changes can damage a truck, or even injure himself."

He sees trouble resulting from overloaded trucks, from carrying questionable loads, or from carrying loose material and he insists that the safety problem is not only associated with the driver, but with the entire plant. "A number of companies have achieved remarkable results by taking simple precautions. Route markings on floors and walls, for instance, are a good reminder to pedestrians that trucks are around. This is especially true at cross aisles, or where there are blind turns.

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HOFFMAN
has the right kind and size of
VACUUM CLEANING EQUIPMENT
to remove your hazard

Put your dust problem up to Hoffman. Our engineers have helped every type of industry to eliminate dust hazards, including abrasive toxic and explosive types. The complete line of Hoffman vacuum cleaning equipment is built for heavy-duty industrial service . . . higher suction, greater capacity . . . available with T.E.F.C. Class I and Class II motors for hazardous locations. Write for Free Survey and descriptive bulletins.

portables

HoffcoVac 15 operates 35-foot length of hose

HoffcoVac 30 operates 50-foot length of hose

Also, HoffcoVac 50 and 75 for use with longer hose lengths, on heavier dust accumulations. PLUS Gasoline-Engine Powered Model.

Hoffman also builds Multi-stage Centrifugal Blowers and Exhausters, for air or gas, in a wide range of capacities, PRESSURES and VACUUM.

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CANADIAN PLANT: NEWMARKET, ONT.

INSIDE THE TRADE

Ansul Appoints

ANSUL Chemical Company, Marinette, Wisconsin, announces the appointment of Paul R. Larimer as General Sales Manager in charge of all four sales divisions—fire extinguisher, refrigeration, industrial chemicals and export.

This is a new post created by the company to help supervise and coordinate the company's sales expansion. Mr. Larimer formerly supervised the company's government relations program and served as Assistant Sales Manager of the Fire Extinguisher Division.

Safety Supply House

THE Saginaw Welding Supply Co., of Saginaw, Michigan, has announced the opening of a new Safety Division under the direction of Gerald Shoskey. Although the concern, located at 426 S. Washington St., has handled industrial safety equipment for several years, the safety devices line has now been reorganized into a separate division with its own sales personnel.

The firm is an authorized distributor for Schrader air control equipment for power presses and also has a complete line of protective clothing. The sales territory covers central and eastern Michigan.

Brewer-Titchener Executive Dies

EDWARD A. BREWER, chairman of the board of The Brewer-Titchener Corporation, Cortland, N. Y., died August 22 at his home after a short illness. He was 69.

A graduate of Yale University, Brewer directed the 130-year old firm's manufacturing operations first as president and later as chairman of the board for the past 30 years. In December of 1951, he was succeeded as president of The Brewer-Titchener Corporation by James H. Greene.

Two sons, Edward R. and William S. Brewer, are actively associated with the firm, whose line of stamping, forging and hardware products include safety hooks for handling materials.

New Address for Wheelco Instruments

WHEELCO Instruments, which recently became a Division of the Barber-Colman Company of Rockford, Ill., has announced that all manufacturing and operating facilities have now been transferred to Rockford. No change has been made in the Wheelco District offices.

New Plant for Day Co.

THE Day Company of Minneapolis announces that its southwestern division plant and offices are now occupying new and larger quarters at 804 N. Throckmorton, Fort Worth, Texas. The firm specializes in the manufacture and installation of dust control systems, pneumatic conveyors, bulk storage bins and related equipment for materials handling. As part of the company's expansion program, the new quarters now provide increased facilities for fabrication and warehousing.

(For further details on advertised products, use the Reader's Inquiry Card on page 115)

New Westinghouse Plant

WESTINGHOUSE Electric Corporation has announced plans to build a multi-million dollar industrial and commercial lighting equipment plant in Vicksburg, Mississippi. It will be the largest plant in the nation devoted exclusively to the manufacture of industrial incandescent and industrial and commercial fluorescent fixtures.

The one story, steel and brick structure will feature the latest in industrial plant design and mechanized equipment. Both manufacturing and warehouse facilities will be provided. Located on a 55-acre site six miles south of the city, it will extend approximately 900-feet along U. S. Route 61.

The products turned out will include fixtures for fluorescent lights that go into schools, offices, stores, and factories, as well as the ballasts for them. Also produced will be fixtures for incandescent and mercury lights that are used in industrial locations.

Gustin-Bacon Appoints

GUSTIN-BACON Manufacturing Company, Kansas City, Mo., announces the appointment of F. H. Ebbert as Vice-President and General Sales Manager. Mr. Ebbert has been Vice-President and Sales Manager of the company's Automotive Division since 1946. In his new capacity, he will have charge of the company's four sales divisions, which are glass fiber insulation products, industrial, railroad, and automotive.

California Distributor

AS OF June 1st, 1952, The Buell W. Nutt Co., which handles safety and industrial equipment at 2225 S. Hoover St., Los Angeles, inaugurated a new selling policy which will be directed to industrial firms who purchase safety equipment for the use of their employees.

A complete stock of safety equipment will be available, including the products of the Bausch & Lomb Optical Co., of Rochester, and those of the Davis Emergency Equipment Co., of Newark, who have just appointed this firm their exclusive representative in Southern California.

As soon as suitable space can be located this business will be moved to new quarters and the facilities for giving prompt and dependable service will be greatly improved.

The experience gained through many years of safety service to industries of the country will insure satisfactory service.

Minnesota Mining & Mfg. Co.

APPOINTMENT of Dr. Charles W. Walton, St. Paul, as general manager of the adhesives and coat-

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APPOINTMENT of Dr. Charles W. Walton, St. Paul, as general manager of the adhesives and coat-

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You will find the REEVES the best STRETCHER for an emergency. They are used by many industrial plants, hospitals, first aid and rescue squads, police and fire departments throughout the country.

STRETCHER CANISTER

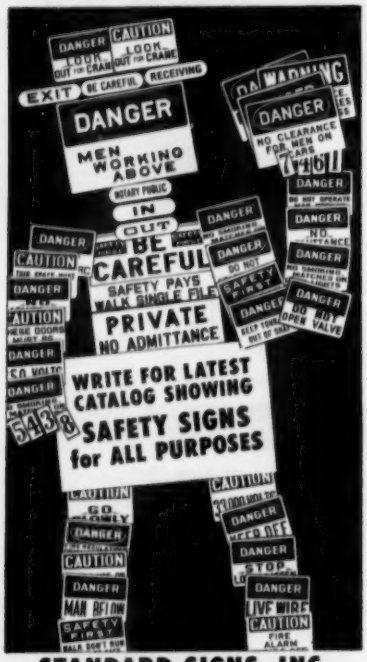
Keep your stretcher ready for an emergency. Store it in a Reeves Stretcher Canister where it will be protected from dirt, dust and dampness.

A. Smith & Son, Inc.

Established Eighteen Hundred Sixty-Seven

1237-39 Ridge Ave. Philadelphia 23

"If It's Made of Canvas, We Make It"



STANDARD SIGNS, INC.

3190 EAST 65th ST., CLEVELAND 27, OHIO

ings division of Minnesota Mining & Manufacturing Co. has been announced. R. P. Carlton, 3M president, named Walton to succeed Louis F. Weyand of Detroit. Weyand recently was made executive vice president in charge of all 3M tape operations.

Walton joined 3M in 1947, and in 1948 he organized and became general manager of the company's new products division.

Walton is president of the Commercial Chemical Development Association and is a member of the American Chemical Society.

Kidde Enters Nuclear Field

THE establishment of the Walter Kidde Nuclear Laboratories, Inc., with the primary objective of developing commercial atomic power, was announced recently.

An associate of other Kidde enterprises, which include Walter Kidde & Company, Inc., manufacturers of fire protection systems and pneumatic devices for aircraft and marine application, Walter Kidde Nuclear Laboratories, Inc., will perform research, development and experimentation in the field of nuclear energy. The services of the firm will be available to other organizations interested in the design of nuclear power plants or in applications of nuclear technology to their products and processes.

Technical activities will be under executive direction of Dr. Karl Cohen, former director of the Atomic Energy Division of The H. K. Ferguson Company and a pioneer in the early scientific work that ultimately led to the wartime Manhattan Project.

The establishment of the new laboratories conforms with the announced policy of the U. S. Atomic Energy Commission which encourages participation of private capital in atomic development.

Dr. Cohen and an associate, Dr. W. I. Thompson, who will be chief engineer for Walter Kidde Nuclear Laboratories, have been engaged for several years in basic development of new types of nuclear reactors. Their research has been directed toward the development of low-cost reactors for eventual commercial application.

The organization's development and engineering work will be conducted at 140 Cedar Street in Manhattan. Laboratory research will be carried out in facilities on Long Island. The organization has an inital staff of 30 scientists and engineers, and present plans are to expand this group to 100 during the next 12 to 24 months.

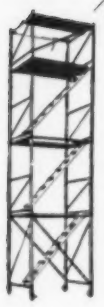
W. E. Geidt Honored

WILLIAM E. GEIDT has recently been elected president of the Chicago Advertising Association. Mr. Geidt has gained prominence in the advertising field through his activities as Advertising Manager of Inland Steel Co.,

(For further details on advertised products, use the Reader's Inquiry Card on page 115)

Scaffolds for any purpose — Any Place — Any Time with

GOLD MEDAL® and TROUBLE SAVER Equipment



ALUMINUM

SECTIONAL ROLLING SCAFFOLDS

SECTIONAL LADDER SCAFFOLDS

Safe, rigid—one man can assemble. Compact—easy to store and transport. Puts men at correct, convenient height. Approved by Underwriters' Laboratories.

GOLD MEDAL SAFETY SWINGING SCAFFOLDS

Ideal for many light duty jobs. Steel wire replaces rope tackle. Available in steel or aluminum. Approved by Underwriters' Laboratories.

GOLD MEDAL LADDERS

Single wood ladders—8' to 24'. Extension wood ladders—16' to 52'. Magnesium single, step, extension ladders. Selection includes safety platform step ladders.

"TROUBLE SAVER" SECTIONAL ROLLING SCAFFOLDS

Industrial plants find many uses.
Ladder type frames, as illustrated.
Equipped with positive-lock casters.

TUBE LOX SCAFFOLDS STEEL OR ALUMINUM

Used for all types of indoor or outdoor work.
Only four basic parts required for all jobs.
Strong, rigid, firesafe—easy to erect.
Curved surfaces, irregular contours and other difficult conditions are no problem with Tube Lox.

GOLD MEDAL SAFETY EXTENSION TRESTLES

Save time on many types of overhead work.
Heavy construction for maximum safety.
Sizes: 6' to 16'.
Approved by Underwriters' Laboratories.

GOLD MEDAL LADDERS SCAFFOLDING ®

for Greater Safety . . . Efficiency . . . Economy

THE PATENT SCAFFOLDING CO., Inc.

Dept. SM&P, WEST COAST PLANT, 6931 STANFORD AVE., LOS ANGELES 1, CALIFORNIA

(For further details, use the Reader's Inquiry Card on page 115)

pioneers in the manufacture of slip-resistant rolled steel floor plate.

Polis Company Expands

THE J. D. Polis Manufacturing Co. of Chicago has announced that sometime in October it will move from its present W. Ogden Avenue address to a newly completed building at 2900 W. 26th St., at the corner of Francisco St. The company's new building will permit increased production of their improved self-drilling expansion shells for fastening equipment to concrete, brick and stone, as well as enlarged facilities for their line of Underwriters' Laboratories-approved safety gasoline cans and approved excelsior bins.

Free and Convenient!
See page 115

Put Color to Work

COLOR plays a major part in more efficient industrial plant operations, promotes safety and cuts down on absenteeism and personnel turnover. It also has been determined that proper colors not only boost morale but offer numerous psychological benefits. The personal habits of workers also are affected by another contributing factor—environment.

"Management prestige can be increased by showing regard for the personal comfort of employees," according to Floyd E. Frazier, director of the industrial division of an insurance organization.

"An investment in the intelligent and purposeful selection of proper colors can bring tremendous dividends."

By using the right colors, the company, said not only will much eyestrain be eliminated but visual and physical fatigue will be offset. Both are major considerations in accidents, and insurance companies constantly work to reduce losses in order to pass on savings to policyholders.

For areas of high and uncomfortable temperatures, the traditional use of white walls not only introduces glare but actually produces greater strain. To offset this, a pale bluish-green should be used to break the monotony. It not only is cool and pleasant to the eyes but helps the employee concentrate on working areas and the job at hand.

Glare and Contrasts Cause Eyestrain

Eyestrain also is aggravated by glare and great contrasts in light and dark areas. Exposed electric light bulbs should be raised overhead and equipped with reflectors or diffusing globes rather than hanging low in

Group of RUEMELIN Fume Collectors Keeps Shop Clear of Welding Fumes

This well ventilated welding department is typical of hundreds of similar installations. Welding operators appreciate smoke and gas-free atmosphere. Thousands in service. Many repeat orders. Collecting fumes at the source with local exhaust hoods has proven most practical in operation. It is particularly helpful in winter months when doors and windows are closed. Write for Bulletin 37-D describing all types of Ruemelin Fume Collectors.

RUEMELIN MFG. CO.

MFRS. & ENGRS. • SAND BLAST & DUST COLLECTING EQUIPMENT
3892 NORTH PALMER STREET • MILWAUKEE 12, WISCONSIN, U. S. A.

AWARD EMBLEMS

SERVICE

Recognize your veteran employees—increase loyalty—reduce labor turnover. Show your appreciation for years of loyal service with a Metal Arts Service Award Emblem.

SAFETY

Fewer Accidents mean more manpower, less lost time. Encourage safety with our Safety Emblems. Emblems can be applied to tie clasps, money clips, lighters, etc.

QUOTA CLUB

Start a Quota Club and watch your sales increase. Your salesmen will be proud to earn the right to wear an emblem with your company name.

SUGGESTION

Augment your cash award with a distinctive emblem. Promote competition among your workers. Increase labor, material and method savings.

Also Identification Badges, Plaques, Name Plates, Trophies, Bronze Advertising Novelties, etc.

Write for Our Brochures

METAL ARTS CO., Inc.
742 Portland Ave. Dept. 13 Rochester 21, N.Y.

the field of direct vision.

Variety in color can be provided in corridors and stairways by use of a pale yellow or ivory to brighten the areas. Locker and washroom color standards recommended include tones of blue for male facilities and a pale rose or pinkish tone for female.

Employees are sensitive to working conditions, Frazier said. Greater elements of neatness, enthusiasm and cooperation can be obtained by the proper use of colors throughout all areas of the plants, wherever feasible.

SAFETY ACHIEVEMENTS

THE Chief of the Bureau of Ordnance, Department of the Navy, Washington, D. C. has informed the Commanding Officer of Oahu Naval Ammunition Depot that his station exceeded all other Bureau of Ordnance Activities, 54 in number, in their Civilian Safe Driving record for the period Jan. 1 to June 1952.

NAD Oahu, on this current report, tops all other Bureau of Ordnance Activities with a record of 960,411 miles per accident and has an expense record of but $10.41 accident cost per 100,000 miles of driving.

The 960,411 miles per accident is more than twice as good as next nearest competitor, and is six times as good as the average of all Bureau of Ordnance stations.

A very large part of the mileage in these records is the hauling of high explosives where any accident is apt to be the last one for that driver.

THE Harrison (N. J.) Works of the Otis Elevator Company recently completed 2,000,000 man-hours without a lost-time injury. This figure represents an accumulation of 208 consecutive days since the date of their last lost-time accident and is the greatest accumulation of man-hours without a lost-time injury in their recorded experience.

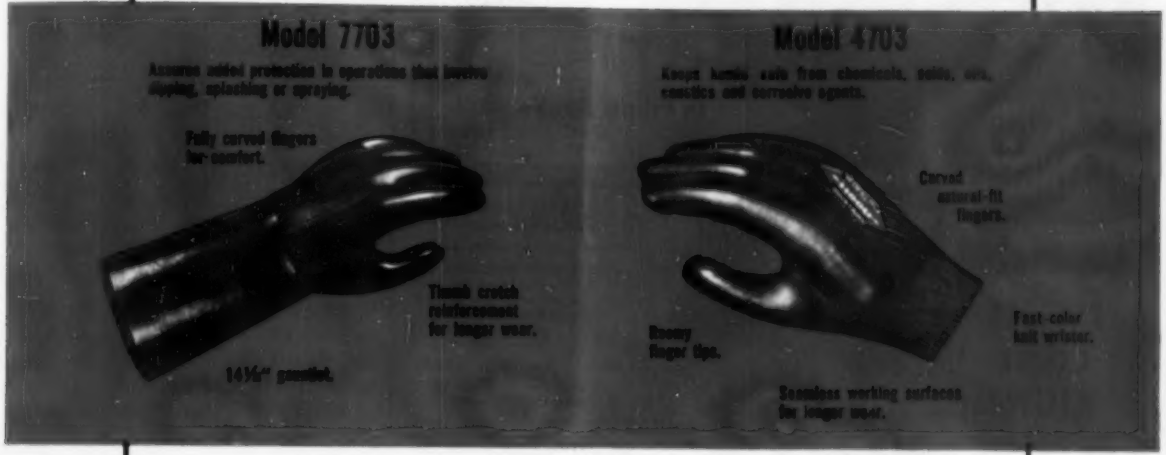
TWO Pittsburgh Plate Glass Company plants at Ford City, Pa., were recently cited by the National Safety Council for their outstanding safety records achieved during 1951. Pittsburgh Plate Safety Director T. R. Donoghue made the award presentations on behalf of the Council.

Each of the Ford City plants amassed a record of 1.1 accidents per million man-hours worked last year which distinguished them as the safest glass plants in the country. Works No. 4, of which D. F. Cannon is Superintendent, was adjudged tops in safety of any flat drawn glass plant for its remarkable record of five lost time accidents in 4,691,213 man-hours worked and received the Award of Honor.

Superintendent Simmons' Works No. 6 plant, which also accom-

(For further details on advertised products, use the Reader's Inquiry Card on page 115)

HOOD Neoprene Coated Gloves
are liquid-proof . . . wear longer


Model 7703
Assures added protection in operations that involve dipping, splashing or spraying.
Fully curved fingers for comfort.
Thumb crotch reinforcement for longer wear.
14½" gauntlet.
Model 4703
Keeps hands safe from chemicals, acids, oils, caustics and corrosive agents.
Curved natural-fit fingers.
Roomy finger tips.
Fast-color knit wristlet.
Seamless working surface for longer wear.

Hood makes a complete line of industrial rubber and plastic gloves to meet every job requirement. Write today for our colorful catalog which features the Hood Glove Guide. It shows you "how to choose the RIGHT glove for EACH job."

HOOD RUBBER CO., Watertown, Mass.

(For further details, use the Reader's Inquiry Card on page 115)

plished an outstanding record with its two lost time accidents in 1,880,433 man-hours, was ineligible for the Award of Honor only because it was under the 3,000,000 minimum man-hours standard for recognition. Its achievement was recognized by the presentation of the Award of Merit

---

THE Award of Honor was presented by the National Safety Council to the X-ray Department of the General Electric Co. in Milwaukee for its record of 3,123,924 uninterrupted man-hours without a disabling injury during a 9-month period of 1951. The X-ray Department was the fifth GE plant to receive the award. Among the major factors which helped the Department achieve its excellent record was the unique system of die guards, in which special grilles are built around each die used in machine shop work.

FOR the tenth consecutive year the Du Pont Company has won the National Safety Council's highest industrial award, its Award of Honor for 1951. Du Pont is the only company in the United States to have achieved the Council's highest honor for ten consecutive years.

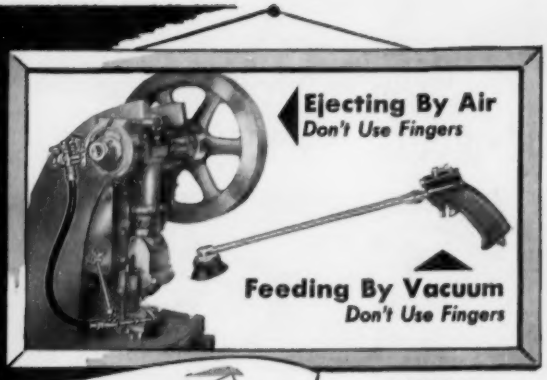
The company set a new, low record of accident frequency last year, the safest in Du Pont history. The frequency rate—that is, the number of time-losing injuries per million man-hours worked—was 0.67 for the company's combined operations last year. This was an improvement of about seven per cent over 1950, Du Pont's previous best year. The rate is substantially less than the most recent available rate of 5.82 for the chemical industry as a whole and the 9.30 for all industry, which have themselves been much improved in recent years.

The award entitles every Du Pont unit to fly the Council's white pennant with green stars marking the successive years the company has won the honor. Many units of the company established outstanding records for safety performance during the year. Their records will be recognized by individual awards by the Council.

Forest Service Unit Cited for Safety

AN OFFICIAL citation for an exceptional unit safety record in avoiding disabling accidents was presented to the Eastern Region of the U. S. Forest Service, at the direction of Secretary of Agriculture

This PICTURE Can be worth $1,000.00 in the SAVING of FINGERS



Amputated Fingers COME HIGH!

These figures are based on maximum rate of Illinois Workmen's Compensation from Division of Statistics and Research, Illinois Industrial Commission. (Figures for other states are higher).

LITTELL AIR BLAST VALVES
Pieces forced out safely by air.
Blank parts weighing up to 2 lbs. are blown out of press with a standard Air Blast Valve.

LITTELL Pres-Vac SAFETY FEEDERS
Blanks fed from a safe distance of 14 inches.
Press-Vac operates from compressed air at 45 lbs. pressure which passes through a venturi to create a vacuum.

F. J. Littell MACHINE CO.
AIR DIVISION
4187 RAVENSWOOD AVE., CHICAGO 13, ILL.
District Offices: Detroit and Cleveland

KEEP YOUR LADDERS "ON THE LEVEL"

Features of
JONNY-FOOT LADDER SAFETY SHOES and STABILIZERS
"The 5-Star Safety Shoe"

★ Ball and Socket Foot permits 100% efficiency performance, with 19 sq. in. of gripping surface.
★ Practically indestructible
★ Lowest cost for life of equipment
★ Easily installed in minutes
★ Three models:
- # 1001: Non-adjustable
- # 1002: One adjustable; one not
- # 1003: Both sides adjustable

JON-NE-FUT Mfg. Co., Inc.
Box 226 • South Gate, Calif.

Charles F. Brannan. The award covers a 7-year safety record among 400 employees performing high-hazard forestry work, largely in rugged terrain in the 14-northeastern states area.

The record cited reached an accident frequency as low as 1.25 percent per million man hours worked in 1951 and has been commented on as one of the best group achievements in public or private employment.

The award, one of the annual distinguished service awards of the Department of Agriculture, was presented to Regional Forester William S. Swingler at the regional headquarters for the Northeastern Region located in Philadelphia, by Mr. William A. Minor, assistant to Secretary Brannan.

In making the presentation, Mr. Minor commented on the unusual achievement of the northeastern Forest Service unit. Much of its work, he pointed out, lies in the rugged terrain of the upland watershed-protection areas in the White and Green Mountains of New England, the Alleghenies and the Blue Ridge in Pennsylvania, Virginia, West Virginia, and the Cumberlands in Kentucky, where the risk is comparable to that in many of the more hazardous areas in the western Rockies.

Despite these extreme conditions, he pointed out that the last fatal injury in the Eastern Region of the Forest Service occurred in 1944 and that one of the seven national forests in the Region, the Allegheny National Forest in northwestern Pennsylvania, had its last disabling injury on December 26, 1946. The Region, he said, is the only unit in the Forest Service which has received the Chief Forester's annual certificate of achievement in safety every year since that award was started back in 1946.

Such safety records, Mr. Minor said, do not just happen. This enviable record, he said, has come about only through the constant stressing of the safety program by the Regional Forester, forest supervisors, rangers and at the managerial and supervisory levels; and by the common acceptance of their accident prevention responsibility by all workers in the Region.

Safety Topics

Are They Accident Prones?

An expert in industrial medicine took exception to the idea that persons who have frequent accidents are in most cases hopelessly "accident prone" or require psychological treatment.

Dr. Frank P. Guidotti, medical director of the New York Hotel Trades Council and Hotel Association Health Center, told the New York Safety Convention that it was generally recognized that some people suffered a disproportionately large number of accidents.

"These people," Dr. Guidotti

(For further details on advertised products, use the Reader's Inquiry Card on page 115)

said, "have been labelled accident prone with the implication that accident proneness is a specific handicap which is either incurable or will yield only to psychological treatment. More often than not, however, accident repeaters are victims of easily discoverable faults which can be removed by common sense.

"For example, a person may have accidents due to faulty vision or because of a lack of physical stamina. He may have some social conflict or friction, whether on or off the job. Faulty vision may be indirectly responsible for causing fatigue, irritability and general insensibility to conditions which would be observed by a more alert person."

The "common sense approach" had helped reduce accidents among repeaters as well as other employees in the hotel industry, Dr. Guidotti reported. He said all 35,000 hotel employees in New York City who are covered by collective bargaining agreements between the Hotel Association and the New York Hotel Trades Council, A. F. of L. are entitled to free medical care at the Health Center set up in 1950 as a joint venture by the Association and the union. The Health Center supplements insurance and hospital care existing since 1945 for hotel employees.

"One of the main objectives of the Health Center," Dr. Guidotti said, "is to provide comprehensive medical examinations and treatment from the standpoint of preventive medicine, in order to keep hotel employees in good health and less prone to accidents."

Setting the economic loss due to industrial accidents at eight billion dollars in this country last year, Dr. Guidotti said this showed the need for "a step forward in the protection and improvement of the health of our industrial workers through a general adult industrial health program."

Such a program, he said, should include pre-placement examinations, as different from pre-employment, to aid industry in properly placing workers in jobs suited to their physical capacity. It should also include periodic health examination because "many diseases begin slowly and may not produce any disabling symptoms until the condition has considerably advanced." Dr. Guidotti said industry had begun in recent years, particularly since World War II's manpower shortages to recognize the need for preventive medicine and general health care service for industrial workers. He said there was a need for much more of that.

"Just put some Anti-Slip Cosmolite on those slippery floors!"

WRITE FOR FREE BOOKLET

NOW you can "cure" those *slippery floor problems* without special products or costly extra labor. New Anti-Slip Cosmolite does the job in jig time. Protects against floor damage as well as accidents. It's applied quickly like an ordinary self-shining wax. Dries bright and stays that way. Eliminates unnecessary buffing. Resists water spotting. Try it now. Sample sent to you on request.

Anti-Slip Cosmolite Wax

HUNTINGTON LABORATORIES, INC.
Huntington, Indiana · Toronto, Canada

(For details, use the Reader's Inquiry Card on page 115)

Industrial Noise

The problem of industrial noise is becoming more serious as machine speeds increase and has aroused community attention, along with air pollution and water pollution. Some industries are already spending

(Continued on page 100)

ACROSS MANAGEMENT'S DESK

Small Company Safety

SMALL companies have from two to five times as many accidents per employee as large companies, A. M. Baltzer, director of the small business and associations program of the National Safety Council, said at the fall meeting of the American Society of Mechanical Engineers in Chicago. Asserting that safety is "good business" for the small business man, he described ways in which help could be obtained from professional societies and trade associations to carry out a safety program.

"In spite of impressive reductions made by some large companies, the overall occupational accident rate is not being reduced proportionately because small companies have approximately two and one-half times as many injuries as large companies," he pointed out.

"Established safety programs more than pay their way in reduced insurance rates, but they bring the added benefits of increased production, improved employee relations, and increased public good will. It is significant that companies and associations with long standing, successful safety programs, have found them so worth-while that their activities tend to increase, even though the accident rate approaches the irreducible minimum.

Small Companies Need Help

"Small companies usually require no trained professional safety engineer, but this means that other supervisors and executives must take on the responsibility for accident prevention in addition to their other duties. The mechanical engineer is in an ideal position to promote accident prevention, because his training is closest to that required by a professional safety engineer.

"Many small companies rely upon their trade association for advice and help in highly specialized fields. In like manner, these companies should rely upon professional societies, such as the ASME, for guidance.

"The mechanical engineer or machine designer is best qualified to guard the power transmission apparatus and points of machine operation. Since approximately 25 percent of all industrial accidents are due to handling materials, the mechanical engineer has an excellent opportunity to devise better and safer ways of handling material, whether by conveyor, power truck, crane or hoist.

"The increased use of welding and cutting equipment is accompanied by both fire and accident hazard. Such a simple thing as anchoring welding cylinders to prevent them from falling over is often overlooked by the welder or maintenance man. A similar example could be drawn in the setting up of new machinery, laying out new operations, and using solvents for degreasing and cutting," he said.

Supervisory Training by Pennsylvania R.R.

MORE than 4200 supervisory employees meeting in 200 classes have completed a 15-week course of study in the Pennsylvania Railroad's new system-wide training program for men who direct the work of others, J. W. Oram, chief of personnel, announced recently. "Dealing with people" is the theme of the weekly meetings of small, informal classes—generally less than 20—conducted by faculty members of 12 outstanding eastern and midwestern colleges and universities.

"The results have been uniformly

PLAY IT SAFE!

Yes, play it safe and get lined up with the needed protection of

DORSEY

SAFE-T-SHOES

(BOOTH 426)

We have any type of protective footwear for any size plant. Get our exceptionally attractive proposition before you go home.

DORSEY-SAFE-T-SHOE CO.
CHATTANOOGA TENN.

DAV-SON BULLETIN BOARDS

Use DAV-SON Cork Back Bulletin Boards for pinning up notices, letters, photos, etc. Many sizes and styles available for your particular requirements.

Write for Special Circular SM

We manufacture the famous DAV-SON Changeable Letter Bulletin Boards, Safety Displays, Lobby Directories and Name Plates for every purpose.

DAV-SON

A.C. DAVENPORT & SON, INC.
ESTABLISHED 1932
311 N. DESPLAINES ST., CHICAGO 6, ILL.

(For further details on advertised products, use the Reader's Inquiry Card on page 115)

MODERN UNIT TYPE
Standardized
FIRST AID PROTECTION

'PAC-KIT' EQUIPMENT

FULLY MEETS SPECIFICATIONS
FOR
AIRCRAFT — AMBULANCES — BUSES
AUTOMOBILES — TRUCKS — RAILROADS
STEAMSHIPS — ALSO PUBLIC UTILITIES
INDUSTRIES — SCHOOLS — FEDERAL
STATE AND MUNICIPAL DEPARTMENTS
INCLUDING POLICE — FIRE AND PARKS.

Write for descriptive literature and direct prices.

VISIT OUR EXHIBIT BOOTH NO. 39 AT THE NATIONAL SAFETY CONGRESS, CHICAGO, ILL.

Ask for a free sample of P-K BURN OINTMENT—The Improved First Aid for Burns

FIRST AID 'PAC-KIT' TRADE-MARK EQUIPMENT

THE PAC-KIT COMPANY
P. O. BOX 1306 **GREENWICH, CONN.**

(For further details, use the Reader's Inquiry Card on page 115)

good," Mr. Oram said. "Practically every man attending the classes has reported they are of definite help, and further evidence of success is found in on-the-job improvement. The enthusiasm of the supervisors is measured by the fact that more than 90 per cent of those eligible take the course."

Class sessions last from one and a half to two hours, scheduled mostly when the men are off-duty, and attendance is voluntary.

"The idea of the program," Mr. Oram said, "is to educate our men in human relations and to help them deal effectively with the problems and responsibilities they face on the job. Also, we emphasize the importance of the supervisor as a representative of management and interpreter of its problems and policies."

Studies planned for class discussion for supervisors in the future include proper handling of specific employee grievances, study of the various working agreements between the management and the employee unions, prevention of loss and damage to freight and the continuing problem of safety.

The training class program grew out of discussions between management and supervisors several years ago. With the assistance of the Management Training Division of Pennsylvania State College, a pilot program, with eight conference groups, was set up on one operating division of the railroad to provide the basis for system-wide expansion.

As another phase of the railroad's expanded personnel plan, its safety organization has completed special classes at Penn State, meeting three times daily for a week. Discussion centered on safety principles from the standpoint of good human relations. Recently the entire personnel organization of the railroad attended a special seminar at Philadelphia to make an intensive study of their jobs as personnel supervisors and specific problems of employee relations. The faculty for this seminar was drawn from the officers of the P.R.R. and college faculties.

Other Countries Ahead of Us in Safety?

AS PROOF that American factory management "seizes with alacrity" any suggestions for improvement of methods, a report issued by a British furniture industry team which visited this country tells the following story:

During the question and answer period which followed the team's inspection of an American furniture factory, one of the British visitors explained how his plant handled a certain method which had just been demonstrated. One of the U.S. factory officials left the room for a few moments, and it was learned afterwards that he had gone out to order an immediate trial of the British method.

"In an average American factory," the team reported, "there seems to be a real desire on the part of all to achieve maximum productivity. . . . The effect is to give a visitor a sense

EMERSON Resuscitators

SIMPLE to operate.

SAFE for adults, children, or infants.

ACCEPTED by the American Medical Association since 1942 for use *by laymen.*

PROVIDE SUCTION, alternating with pressure, to give vital aid to the circulation. Write for free *Medical References on Resuscitation.*

Gas poisoning (coal, illuminating, industrial, monoxide)
Asphyxia of new born babies
Hospital Emergencies

Auto accidents
Smoke suffocation
Heart attacks
Electric shocks

J. H. EMERSON CO.

88 COTTAGE PARK AVE. CAMBRIDGE 40, MASS.

THIS **FREE BOOK**

CAN HELP **PREVENT THIS**

Especially written for safety inspectors and maintenance supervisors directly responsible for the safety of press operators, "Power Press Protection" is yours for the asking. Contains valuable information on the maintenance and safe operation of power presses. Send for your copy today.

JUNKIN SAFETY APPLIANCE CO.
101 S. Floyd St.
LOUISVILLE 8, KENTUCKY

of urgency and aliveness in American industry which is not always met in a similar British organization."

In five weeks last year, the 16-member British team visited 38 American factories in Massachusetts, New York, Illinois, Michigan, Kentucky, North Carolina, Virginia and Maryland.

In its recommendations to the British industry as a result of this study, the team asked management to define functions and responsibility clearly and to de-centralize responsibility from top management down to the work bench; to recruit young, enthusiastic executives with the real intention of giving such men an opportunity, and to welcome competitors who want to see your methods and techniques of production, because "a closed door keeps out more than it keeps in."

The U.S. methods in materials handling impressed the British furniture team as it has nearly every productivity and technical assistance team brought to this country in the last three years by the Mutual Security Agency and its predecessor, the Economic Cooperation Administration.

In one area, safety precautions in the furniture factory, the British were not at all sure the American system was ahead of theirs. "To British eyes," the team reported, "the American woodcutting machinery is much less adequately guarded and much of it would certainly not reach the safety standards embodied in the British Factory Acts."

However, they noted a fundamental difference in approach to safety—the British basing their approach on legislation to reduce the risk of accidents, while the American accent "is on creating an attitude of mind, a safety-consciousness."

Noting that it would not be feasible completely to change the safety system of either country, the team suggested that "a blending of both methods might lead to a greater freedom of accidents and so to greater productivity."

But one fire safety device, the sprinkler system, they found to be of much more widespread use in America than in Britain, and they called for a British Government investigation into the high cost, lack of competition and delays in installation of sprinkler systems in England.

"Every factory visited in America was protected by sprinkler systems but many in this country are not," the report stated. "Our manufacturing capacity is part of the national wealth and is too valuable to burn."

While the greater part of the report is devoted to technical discussion of U.S. production and sales methods, management techniques and industrial relations, some of the observations point up small but revealing differences in British and American styles and ways of life.

WHAT'S NEW?

See pages 112–114

"Every American should have a nest egg"

FREDERICK C. CRAWFORD
President, Thompson Products, Inc.

"That nest egg can be in the form of U. S. Defense Bonds—a patriotic equivalent of cash. Defense-bond dollars grow. Americans who enroll in the Payroll Savings Plan become shareholders in Uncle Sam, Inc. With their chips in the game they are helping the country to deal with problems of finance and inflation. As investors in the nation they are more apt to vote for wise government policies to safeguard their investment."

Certainly every American should have a nest egg—and millions of them will: over 7,000,000 employed men and women, enrolled members of the Payroll Savings Plan, are putting aside approximately $150,000,000 per month in the improved U. S. Defense Bonds.

And there is no safer, better way to make dollars grow: the cash value of Series E Bonds held by individuals on December 31, 1951, amounted to $34.8 billion—$4.8 billion more than the cash value of Series E Bonds outstanding in August, 1945.

Employers, too, benefit from the Payroll Savings Plan: the Payroll Saver is a serious worker. He thinks twice before he takes a day off—he's mindful of the effect on his take-home savings. He's a more careful worker—he wants to keep off the accident list. Records show that as employee participation increases, absenteeism and "Lost Time Accidents" decrease and the production curve goes up.

Call for a report on your Payroll Savings Plan. What is the percentage of employee participation? Is the plan being brought to the attention of new employees?

If your percentage is less than 50%, phone, wire or write to Savings Bond Division, U. S. Treasury Department, Suite 700, Washington Building, Washington, D. C. Your State Director will explain how easy it is to conduct a person-to-person canvass that will put a Payroll Savings Blank in the hands of every one of your employees. That's all you have to do. Your employees will do the rest—they *want* to join the plan that provides for their security.

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SAFETY MAINTENANCE & PRODUCTION

THE Future SHOWS

Chicago, Ill.

Oct. 20–24. Fortieth National Safety Congress & Exposition. (Industrial safety sessions at Conrad Hilton, Congress, etc. Hotels, Traffic safety at Congress Hotel.) R. L. Forney, General Secretary, National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

Cleveland, Ohio

October 20–24. Eightieth Annual Meeting of the American Public Health Association, (Public Auditorium). Dr. Reginald M. Atwater, Executive Secretary, American Public Health Association, 1790 Broadway, New York, N. Y.

Houston, Texas

October 27–31. Combined meeting of the National Rural Electric Job Training & Safety Congress, and the Texas Job Training & Safety Training Program for Rural Electric Cooperatives, (Shamrock Hotel). W. W. Mills, chairman, National Planning Committee, F. E. 236, College Station, Texas.

Cincinnati, Ohio

November 12–13. Second Annual Greater Cincinnati Safety Conference & Exhibit. (Gibson Hotel) Kenneth R. Miller, Coordinator, c/o Greater Cincinnati Safety Council, 1203 Federal Reserve Bank Bldg., Cincinnati 2, Ohio.

Cleveland, Ohio

January 19–22. Fourth Annual Plant Maintenance Show & Conference, (Public Auditorium). Clapp & Poliak, Inc., exposition managers, 341 Madison Ave., New York 17, N. Y.

Atlanta, Ga.

March 1–3. Thirteenth Southern Safety Conference & Exposition. (Atlanta Biltmore Hotel). W. L. Groth, executive director, P. O. Box 8927, Richmond 25, Va.

New York, N. Y.

March 24–27. Twenty-third Annual Greater New York Safety Convention & Exposition. (Hotel Statler). E. Willard Merritt, general chairman, Greater New York Safety Council, Inc., 60 E. 42nd St., New York 17, N. Y.

Pittsburgh, Pa.

April 28–30. Twenty-eighth Annual Western Pennsylvania Safety Conference & Exhibit. Harry H. Brainerd, executive secretary, 605 Park Bldg., Pittsburgh 22, Pa.

N. Y. Safety Show

DATES for New York's twenty-third annual Safety Convention and Exposition have been announced by the Greater New York Safety Council, simultaneously with the election of E. Willard Merritt as general chairman for the event. The 1953 convention will be held at the Hotel Statler March 24, 25, 26 and 27.

Mr. Merritt, field supervisor of safety of the Walter G. Legge Company, Inc., and the two general vice-chairmen were elected by the interim committee, made up of the general chairmen of past conventions. General vice-chairmen for the 1953 convention are George E. Decker, and Harry H. Williams. Walter A. Gustafson, chairman of the 1952 convention, heads the interim committee.

The convention brings annually to New York 10,000 accident prevention workers and leaders in traffic, engineering, law enforcement and other fields of safety from all parts of the nation.

Safety Topics

(Continued from page 95)

millions of dollars yearly on noise control equipment, Martin Hirschorn, president of the Industrial Acoustics Company, told a session. However, said Mr. Hirschorn, plant

For Safety
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Hat
Combines utmost protection and style. Exclusive patented features found in no other hat.
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and machinery designers so far have "not been too conscious of noise factors and this is reflected in the present high industrial noise levels.".

Mr. Hirschorn said it was possible that people today were more sensitive to noise than their forebears, but it was certain that the tendency of modern engineering design was to build for more power, higher speeds and less weight, all these contributing towards noisier machinery. Temporary or permanent partial deafness has been caused by many industrial noises, but no other physiological effects have been observed in noise levels up to about 120 decibels, he said.

However, declared Mr. Hirschorn, the effects on man of turbo-jet engine noise and siren generated sounds of the order of 150 decibels has been found to include, besides severe temporary hearing loss, heating of the skin, apparent weakening of the muscular structure, vibration of cranial bones, air movement in nasal passages and sinuses, and blurred vision.

"It is well known," he added, "That the feeling of individual annoyance due to unpleasant sounds makes individuals irritable and may adversely affect their attitude towards their jobs."

Darkness Expensive

The streets of Detroit and the subways of New York were cited as examples of how proper illumination can reduce accidents. The sight conservation session was told that the application of more scientific street lighting in Detroit had effectively reduced the number of fatal accidents.

H. L. Logan, Vice-President in charge of research for the Holophane Company, of New York, reported on a study of space-lighting accidents on Detroit streets over a seven-year period. He said that during 1934–36, before and in the period of partial installation of improved street lighting, there was an annual average of 48 fatal accidents of that type. During 1937–41, after modernization, the average was 16.

Mr. Logan said that "one of the more obvious accident-breeders still persisted in" by industry was the use of local lighting on machinery and the practice of turning on lights in some work areas only at the moment work was being done there. He said general and constant lighting would have saved many workmen's lives.

Twenty-two per cent of all industrial accidents strike at fingers, and eight per cent at hands, Mr. Logan said. The other percentages are eyes, four per cent; head, seven per cent; arms, nine per cent; trunk, 20 per cent; legs, fifteen per cent; feet, eight per cent; toes, five per cent; and four per cent are general.

"This shows," he declared, "that 30 per cent of all industrial accidents strike at the hands and fingers. The implication is strong that, in the absence of satisfactory visual clues, many workers are forced to rely unduly on their sense of touch.

"The blackout accident figures of World War II are another indication of the relation of light to accidents," Mr. Logan said. "During the war pedestrian fatalities rose during the blackout to seven times the daylight rate despite the severe reduction in night traffic. Dickens' 'Scrooge' liked darkness because it was 'so cheap', but darkness today is horribly expensive."

Manual Handling

A complete medical report on every man in the plant can help industrial management cut down sharply on materials handling accidents, according to James E. Irving, executive vice-president of the Irving Subway Grating Co., Long Island City, in an address before the 22nd annual convention. Knowing workers' physical conditions is essential for selecting men able to do the lifting job. He decried the practice of picking men simply because they looked husky and healthy.

Citing his company's experience, Mr. Irving reported that medical

What's New?
See pages 112–114

reports showed seemingly robust men afflicted with high blood pressure, heart conditions and other ailments. Foremen are advised on the physical capabilities or limitations of every man. They avoid using those with disabilities or ailments for heavy manual assignments. No new employee is assigned to a job until his medical report is received. In the two years the medical examination requirement has been in force, lost time accidents have diminished surprisingly while production has improved, he declared.

The executive advised assigning only those men who will accept and follow instruction as a team for involved lifting and handling. The plant "Sampson," who considers it an insult unless he handles a job alone, inevitably winds up with backstrain or worse, he maintained.

New **ACME**
PROTECT-A-VALVE

. . . the "STORM DOOR" for Gas Masks

Now Acme introduces an auxiliary valve to solve the problems of frozen valves in sub-zero weather, and curled valves due to rubber solvents. Serving much the same as a storm door serves the home, the Protect-A-Valve is designed for use with the Acme No. 6 face piece—making it safe for use in temperatures as low as 50 degrees below zero. Write for complete details on this approved Acme development to overcome hazards of rubber-solvent atmospheres and to be ready for next winter's freezing problems.

ACME PROTECTION EQUIPMENT COMPANY
3037 West Lake Street, CHICAGO 12, ILLINOIS

(For further details on advertised products, use the Reader's Inquiry Card on page 115)

industrial Hygiene

ASSOCIATE EDITOR
JACOB A. GOLDBERG, A.M., Ph.D.

Research on Off-the-Job Illness

EIGHTEEN experts in technical and administrative aspects of the problem of health have accepted appointments to advise the Research Council for Economic Security in its nationwide Survey on the Economic Aspects of Prolonged Non-Occupational Illness among Employed Persons.

The Research Council, devoted exclusively to research and education in all phases of social and economic security, is currently studying the problem of non-occupational illness and its economic impact upon the individual and his family. Gerhard Hirschfeld, Director of the Council, states that "the ultimate contribution of the survey will be threefold: 1) to industry, which is concerned with the health problem of the worker and the effect of absenteeism due to illness upon the production line; 2) to all community agencies and organizations, whose activities are directly affected by the health of the people they serve; 3) to the nation as a whole, which has a direct stake both economically and socially."

The appointment of the Research Advisory Committee is the outgrowth of a series of regional conferences and meetings with leading representatives of business, professional, labor, medical, hospital, and community groups concerned with the problem of health. The Research Advisory Committee will advise the Research Council in its broad study and render technical assistance in evaluating the results obtained during the two-year study of non-occupational illness.

UNUSUAL OPPORTUNITY

For young man with experience as assistant safety director, safety committeeman or comparable industrial accident prevention activities. Experience with company or employee publications also helpful.

An unusual opportunity for young man with a well established company. Replies kept strictly confidential. Send letters outlining qualifications to:

Box 53
Safety Maintenance & Production
75 Fulton Street
New York 38, N. Y.

Symposium on Industrial Noise

PAUL WASHBURN, president of the National Noise Abatement Council, announced that the third annual Noise Abatement Symposium will be held October 10th at the Armour Research Foundation of the Illinois Institute of Technology, Chicago.

Industrial noise, its effects and control, will be considered at the all-day meeting which will be attended by leading authorities on sound, industrial hygienists, safety and acoustical engineers, industrial physicians, architects, city officials, health officers and others interested in the growing noise problem, Mr. Washburn stated.

Sponsors of the Symposium in addition to the Noise Abatement Council are Acoustical Society of America, Armour Research Foundation, American Industrial Hygiene Association and the Acoustical Materials Association.

B R E C K

FOUR WAYS TO PROTECT SKIN FROM INDUSTRIAL DERMATITIS

BRECK pH7 PROTECTIVE CREAM protects the hands against harsh materials such as cutting compounds, printer's ink, lime, paint and tar. Easily applied, it can be removed with Breck Hand Cleaner or soap and water.

BRECK WATER RESISTANT CREAM guards against the action of water and water solutions. It forms a stable protective film over the skin and is effective for three or four hours.

BRECK HAND CLEANER helps to eliminate the use of harsh, gritty hand cleaners, turpentine and petroleum solvents. Because it is mild, yet effective Breck Hand Cleaner leaves the hands clean and soft.

ACCEPTED COMMITTEE ON COSMETICS AMERICAN MEDICAL ASSOCIATION

BRECK WORK CREAM is used after exposure to degreasing materials. It substitutes fatty materials for the natural skin oils keeping hands soft and pliable.

A Breck Industrial Preparations Booklet is available upon request.

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NEW YORK · CHICAGO · SAN FRANCISCO · OTTAWA CANADA

(For further details, use the Reader's Inquiry Card on page 115)

A Soap with Protective Coloration

Workers handling explosives avoid dermatitis by using a soap that not only washes away the irritants but also gives a danger signal if the skin is not really clean.

ALTHOUGH most people would be surprised and possibly quite shocked to find their soaped skin turning a brilliant red or a bright yellow-orange, many employees accept such a phenomenon as a matter of course in connection with shell-loading at the Wolf Creek Ordnance Plant at Milan, Tennessee.

For the presence of the unnatural color is nothing to be alarmed about. It is merely a signal—a warning that

This is not dirt! During soaping process with "indicator" soap, dark areas show presence of tetryl on the skin.

All clear—clean and safe! Color has disappeared along with tetryl.

For detailed descriptions of skin protection products, see pages 262–282 of: "Best's Safety and Maintenance Directory" 1952–53 Edition.

some explosive residue, either T. N. T. or "tetryl," still remains on the body.

The worker just scrubs a bit longer until the color disappears and then steps from the shower room, confident that he is free of the contaminating explosive.

This convenient phenomenon is the direct result of a new type of soap, made to government specifications, and containing about five per cent of potassium sulfite. This compound reacts with T. N. T. to produce the yellow-orange color and with the tetryl to form the red.

This soap is but one of many factors which have contributed so greatly to the outstanding safety records which the shell-loading plant has hung up.

Through just such methods as these, the ammunition industry, which is basically inherent with danger, has been transformed into one which, during World War II, was second in safety only to the ladies' garment industry. In 1951, the ammunition industry was presented the National Safety Council Award.

The advantages of the coloring properties of this soap are obvious. The fact is that ordinary soap and water will adequately remove these explosives from the body but some signal is needed to show when the washing has been thorough enough. This so-called "indicator soap" was found to be the answer. The potassium sulfite, added to the soap for this purpose, develops "technicolor" reactions with the explosives as long as any remain on the skin, but it does not itself have any cleansing action.

At present, at least at the Milan plant, this soap is being used only to combat these two specific substances.

Check and Double Check

The use of this new product is compulsory with those workers who come in contact with "bulk explosives"—those which are not yet sealed in. Also, employees on these production lines are issued fresh uniforms free of charge daily and the wearing of these uniforms is mandatory. At the termination of their work day, they retire to a "change house," one of which is located on each line or area. Here they are required to shower.

Treatment for the removal of these explosive residues, however, does not end with the use of indicator soap. As the workers emerge from the shower rooms an attendant applies a solution known as "Webster's Reagent" to various parts of the body. The reagent is much more sensitive than the soap and any trace of the explosive which remains on the body is immediately revealed when the solution is applied. The reagent, which has no cleaning properties in itself, is used as a double-check. In addition, employees are faced with occasional, surprise checkups.

The necessary frequent use of soap and water and the actual importance of cleanliness is drilled into each employee regularly. Before workers are assigned to a production line, they are lectured thoroughly on all safety measures, including hygiene. Those coming in contact with any of the virulent substances are exhorted to wash before taking a rest period, before eating lunch,

HOW MUCH ARE SLIPPING ACCIDENTS COSTING YOU?

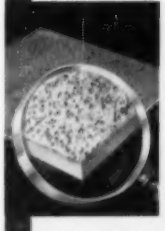
ACCIDENT REPORT
Cause of accident:
Man fell on a slippery floor.
Means of prevention:
Install A.W. ALGRIP Abrasive Rolled Steel Floor Plate.

There's an easy, economical way to end slipping accidents that steal man-hours and drag production down. Put positive non-slip protection in your plant with A.W. ALGRIP Abrasive Rolled Steel Floor Plate.

NON-SLIP—EVEN ON STEEP INCLINES!

ALGRIP is made by rolling tough abrasive grain (the same kind used in grinding wheels) *uniformly* as an integral part of the steel plate's upper portion. When you walk on ALGRIP, hundreds of tiny safety brakes grip your feet at every step. *Result:* It's virtually impossible to slip—even on steep inclines.

WEAR WON'T WEAR OUT ITS SAFETY!



ALGRIP'S safety isn't merely a surface treatment. Note the even distribution *and* depth of the abrasive grain. As the surface wears, new particles are exposed, so ALGRIP keeps its non-slip qualities for a lifetime. It needs no maintenance. Rolled steel makes it stronger than other abrasive floorings. It withstands hard blows and heavy loads without cracking or breaking. And thinner sections can be used without reducing load carrying capacity.

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Our new Booklet A-14 gives complete technical details, suggests uses. Write for your free copy. *It may save you countless hours and dollars!*

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ABRASIVE ROLLED STEEL FLOOR PLATE

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Other products: PERMACLAD Stainless Clad Steel A.W. SUPER-DIAMOND Floor Plate • Plates Sheets • Strip • (Alloy and Special Grades)

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(For details, use the Reader's Inquiry Card on page 115)

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QUIK-LABEL PIPE MARKERS

Identify every pipe in your plant quickly and inexpensively with Brady Pipe Markers. They give you a uniform system of identification based on ASA Standard A13. Anyone can apply and everyone can identify the pipe contents and direction of flow. Cut maintenance time. Make your plant a safer place to work. Over 235 different markers in stock. Specials made to order.

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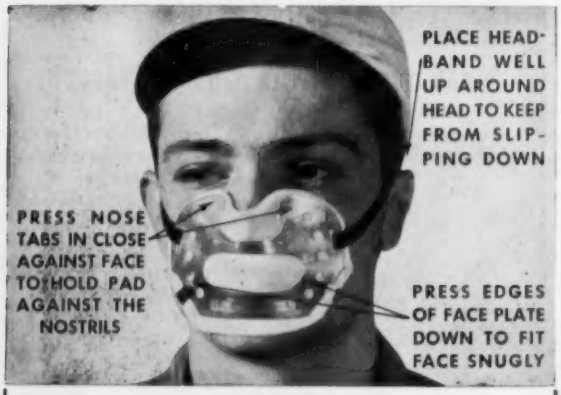
PLACE HEADBAND WELL UP AROUND HEAD TO KEEP FROM SLIPPING DOWN
PRESS NOSE TABS IN CLOSE AGAINST FACE TO HOLD PAD AGAINST THE NOSTRILS
PRESS EDGES OF FACE PLATE DOWN TO FIT FACE SNUGLY

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PROTECTIVE MASKS

These light-weight aluminum masks provide protection against over 400 dusts such as wood, coal, lime, salt, cement, grain, rust, paper, textiles, some insecticides, paint spray from non-toxic paints, etc. Pads can be changed in a few seconds. Only clean gauze touches skin. Comfortable to wear. Workers like them.

Martindale Protective Masks	$.30 each
No. 1 Refills (Standard weight)	.02 each
No. 2 Refills (Heavy weight)	.02½ each

Write for quantity discounts

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(For details, use the Reader's Inquiry Card on page 115)

before smoking and prior to doing anything which might bring their hands into contact with their mouths.

Dangers of Exposure

Although the tetryl has no really dangerous effects, except in rare, isolated cases, it can cause painful irritation and certain areas of the body have shown extra vulnerability. These body areas include the face (particularly the eyelids), the neck, hands, and wrists. T. N. T. is slightly more treacherous than the tetryl. Overlong exposure invites the assimilation of the explosive into the bloodstream and, in extreme cases, illness can result.

Considering everything, the soap and water war against careless hygienic practices assumes an important role in the plant's program of safety.

"It is quite difficult to overestimate the vital importance of personal cleanliness in our organization, or in any organization of this kind in general." This statement came from Harry N. Pasley, industrial hygienist for the shell-loading plant. "Neglect in this essential practice can cause the loss of many workhours. We drill into our employees the necessity and desirability of keeping as clean as possible, for their own individual protection.

"We also take great pains to keep the working areas and the machinery as clean as possible, along with everything else with which the worker has to come in contact. The management and employees are associated in a never-ending battle for a cleaner and safer plant, and cleaner and healthier employees."

In addition to the indoctrination on safety, employees have safety meetings several times each week and the safety department issues a special report bulletin monthly. Both continually preach plant and personal cleanliness.

All personnel working in bulk explosives have periodic, complete physical checkups at the plant hospital. Here they are examined for any possible absorption of, or reaction to, the explosive chemicals with which they are working.

The Nordic types, blondes and redheads, receive careful screening for they usually have skin much more sensitive to irradiation.

One of the equally important tasks of the plant management is the care and cleaning of the uniforms worn by the employees.

The first step in the cleaning process involves the use of a great deal of water with a minimum of soap. Both explosives will "float off" in water near the boiling point. Following this initial treatment, a regular laundering process is next in line. Then the finished job is spot-tested with "Webster's Reagent" to make sure the clothing is entirely free of the explosive material.

There are many of the plant's approximately 7,500 employees who do not work in close contact with the explosive substances, but all are urged to make full use of the plant's new soap and washing facilities.

Pictures by courtesy of the Cleanliness Bureau.

Fig. 1 Opening of mold which holds tubes filled with nickel flakes and nickel hydrate. The dust is exhausted through the perforated plate on which the man works.

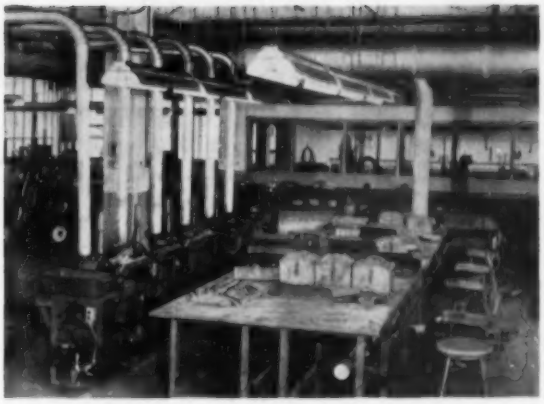

Fig. 2 An overall view showing both the up-draft hood and the down-draft perforated plate methods for controlling dusts. Notice that the smaller piping leads to larger pipes which carry the dust to collectors located on the roof.

By W. O. VEDDER
Manager, Dust Control Department
Pangborn Corporation
Hagerstown, Maryland

DUST CONTROL PAYS FOR ITSELF

A dust-control system not only aids safety, plant maintenance, and productive output, but also pays its own way through the reuse of recovered material.

THE dust-control system of the Storage Battery Division of Thomas A. Edison, Incorporated, West Orange, N. J., pays for itself in recovered material alone. In addition, by providing a dust-free atmosphere, the system improves working conditions in regard to both safety and comfort.

The system recovers nickel, nickel hydrate and iron oxide dusts. These chemicals are used in the manufacture of positive and negative plates of nickel-iron-alkaline storage batteries.

Two methods are used at dust-producing sources to control dust. One is the conventional exhaust hood; the other is the unusual "down-draft" arrangement. This latter technique is used at work tables where the usual up-draft hood arrangement would draw light dusts away from the work area. Fig. 1 shows a tube mold being opened after the tubes have been filled. The

Fig. 3 Two rooftop dust collectors in parallel serve the "negative plate" (iron oxide) room and one collector serves the "positive plate" (nickel flake and nickel hydrate) room. Exhaust air is discharged through a "plenum chamber" before release to the atmosphere to eliminate whistling.

For detailed descriptions of Dust Control products, see pages 400–419 of "Best's Safety & Maintenance Directory," 1952–53 Edition.

148,920 hours of honor

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perforated plate is built right into the bench, and work is performed directly on the plate. The dust produced by the operation is exhausted down through the perforations.

Variations of Principle

In perfecting the system, a portion of the perforations were sealed in certain cases to improve suction. In another case, the air velocity was so high that an irritating whistle was created. This was corrected by countersinking the under edges of the holes.

HANDEEZ

REMOVES SHOP GRIME SAFELY!

Don't confuse HANDEEZ with ordinary harsh abrasive-action hand cleaning compounds. HANDEEZ works differently—through a gentle emulsifier blended with a sterilized vegetable emollient. It lifts grime from the pores, leaving skin tissue unharmed and unbroken by tiny crevices which invite infection. Cutting oils and other deep-seated shop grime yield readily to the HANDEEZ formula which spells prompt, efficient cleansing with the added skin-safety factor.

Write for the booklet "Be Kind to these Hands."

dependable **DOLGE**
WESTPORT, CONNECTICUT

(For details, use the Reader's Inquiry Card on page 115)

Fig. 2 illustrates both the up-draft hood and down-draft perforated-plate methods. Notice that the branch piping from both connect into large pipes at the ceiling. These pipes lead to the dust collectors on the roof, shown in Fig. 3.

The "positive plate" room in which nickel flake and nickel hydrate are handled is served by a system having a capacity of approximately 41,500 cfm and a new double collector. The "negative plate" (iron oxide) room is served by a system with a capacity of approximately 31,500 cfm. This system is connected to two existing double collectors operated in parallel and relocated on the building roof.

In addition to the tube-filling operations, dust is also controlled and collected at secondary operations—reaming, capping, inspection, plate assembly, pressing and grooving. These operations produce about 25 percent of the dust collected; filling produces the rest.

Collecting Equipment

The dust collectors are of the cloth-screen type. This

(Continued on page 111)

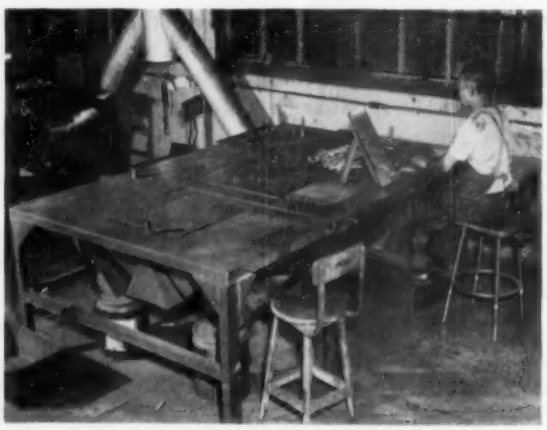

Fig. 4 Down-draft perforated-plate method of dust control. Notice, also, the containers under the table. Workers scrape residues into lips at table's edge; chutes lead from lips to containers. The chutes are welded to the container covers.

THE INDUSTRIAL Nurse

EDITOR
ROSAMOND J. WEBSTER, R.N., A.M., Ph.D.

New Labor Legislation

THE report of the U. S. Bureau of Labor Standards dealing with new labor legislation for the year ending September 15, 1951 has recently become available (Bulletin #152). In the area of industrial health and safety, continuing a trend of the last few years, a number of states passed acts to improve the safety of workmen on their jobs.

The general rule-making authority of the Industrial Accident Board of Montana was strengthened. Legislatures in three states granted rule-making authority limited to specific industries: in Michigan, to the construction of buildings, bridges, and sewers; in Tennessee, to the construction, operation, and maintenance of elevators; and in Washington, to the construction, repair and operation of boilers. The Industrial Accident Commission of Oregon was authorized to make inspections of electric lines and to enforce orders as to their construction, maintenance and operation. A schedule of hours for work under compressed air has been established by a new Indiana law.

Laws relating to the reporting of accidents or violation of safety laws were passed in five states: California, Connecticut, Idaho, Oregon, and Rhode Island. In California the minimum fine for failure to report an accident was increased from $10 to $25. An Idaho amendment specified that when the Commissioner of Labor or his agent finds a violation of a law relating to safety and sanitary conditions, he must notify the employer direct and make recommendations for the correction of such conditions, instead of first making a report to the Industrial Accident Board. The law also authorized the Commissioner to require that the place of business or equipment be constructed and maintained in conformity with reasonable standards of safety. In Washington an act providing for a State Safety Council was passed. Employees in Pennsylvania, according to a new law, are to be provided with gloves and other devices to protect them against sharp or rough surfaces or materials. Many other labor laws or amendments to existing legislation were enacted. Copies of the Bulletin (205 pages) can be obtained from the Government Printing Office, Washington, D. C. (price 50 cents)

Platform of the ANA

MANY useful guides are provided for industrial nurses in the platform adopted by the American Nurses' Association. The three major areas of consideration in this document include the following: (1) To provide health protection for the American people; (2) To aid nurses to become more effective and more secure members of their profession; and (3) To promote better health care for the peoples of the world.

Particular items of special interest include: (1) Cooperating with the Federal Civil Defense Administration and the Department of National Defense in promoting health care in times of emergency; (2) Promoting the inclusion of nursing benefits in prepaid health and medical care plans; (3) Improving the practice of nurses and developing standards of nursing care through controlled studies of nursing functions; (4) Promoting state nursing practice laws which will protect the public and aid the nursing profession; (5) Increasing the supply of competent nursing personnel; (6) Encouraging nurses to recognize and to meet emotional, spiritual, and social, as well as physical needs of patients; (7) Promoting legislation which will provide financial aid for the expansion and improvement of nursing education programs; (8) Continuing to develop professional, vocational, and educational counseling for nurses; (9) Promoting the inclusion and full participation of minority groups in association activities; (10) Supporting the international exchange of students and teachers of nursing; (11) Continuing to support the United Nations and its specialized agencies, particularly the World Health Organization; (12) Promoting better under-

The Answer to Industrial Dermatitis

is just as simple as this . . . .

where irritation and defatting of the skin arise from frequent contact with solvents, chemicals, paint spray, etc. . . . Skin Cote Creams provide an invisible film over the skin setting up a barrier to the irritant material. Also important to you is the fact that Skin Cote Creams are superfatted with U. S. P. grade oils and lanolin to help restore any loss of the natural skin oils and fats.

Send today for detailed information on the cream to fit your operations—you will find that the answer to industrial dermatitis is just as simple as this.

"Skin Cote Fortifies the Future of Working Hands"

The Boyer-Campbell Company

6532 St. Antoine St. *Safety division* Detroit 2, Mich.

FLAMEPROOFING COMPOUNDS

FOR WOOD, plywood, acoustical boards

FOR TEXTILES, all kinds, including Acetate Rayon

FOR CHRISTMAS TREES, garlands, decorative materials

Approved by State Fire Marshals, Fire Departments. Listed by Underwriters' Laboratories. Used by the Armed Forces.

MANUFACTURED BY

FLAMORT CHEMICAL CO.

746 Natoma Street

SAN FRANCISCO 3, CALIFORNIA

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standing and interpersonal relationships both at home and abroad.

While most of the provisions are more or less general in character, their acceptance and appreciation by nurses in industry, as well as by other groups of nurses, should specifically be of help in the promotion of good health, good interpersonal relations, and effective service in the medical departments of commercial and industrial establishments.

Human Relations

THE influence of satisfactory human relations on plant production has long been recognized. Likewise, the integral relation between the attitudes of supervisors and the sickness and absentee records has received some attention. An official of the U. S. Public Health Service has stressed the importance of good human relations in occupational health. He defines an effective occupational health program as one that is carried out primarily for the benefit of the workers. Its objectives should be as follows: (1) The assessment of a worker's physical and psychological assets, as well as his liabilities, to facilitate proper selection and placement, (2) The prevention of occupational and non-occupational illnesses, (3) The provision of treatment, the type and extent of which depends on the policy of the plant, (4) The fostering of a personal, physical, mental and social ability to work and enjoy life beyond the mere absence of disease or infirmity.

Human relations are concerned with interpersonal contacts, and how people get along with each other. From the point of view of industry, the immediate supervisors carry the major burden of satisfactory human relations. The foreman who habitually attempts to impress others with his authority, demands implicit attention to his orders, fails to consider the needs and abilities of his gang or team of workers, and does not acknowledge a job well done is arousing a negative situation insofar as human relations are concerned. The phenomenon of psychosomatic complaints is sufficiently recognized to warrant the conclusion that such supervisors may be responsible for an increase in plant dispensary attendance, minor accidental injuries, overstress of disabilities, and increase in absenteeism. Studies have indicated the relatively high absence rates in groups suffering from poor supervisors. Absence records are another valued source of such information. And the industrial nurse who has the confidence of the workers can be of much help in instruction of foremen to help them do a better job.

Some TB Facts

AN EXTENSIVE study has been completed of the known patients with tuberculosis who have settled in Arizona. This state has attracted many sufferers with

(For further details on advertised products, use the Reader's Inquiry Card on page 115)

respiratory and other ailments. The mild climate has lured many, and the publicity has impressed the sick with the possibility of an easy and early cure. In this study of 1,735 patients known to have tuberculosis, it is interesting to note that they come from 46 states, the District of Columbia, Alaska, Mexico, and other foreign countries. Growing out of this study has come the recommendation for the need of wide publicity concerning the ineffectiveness of climate alone as a cure for tuberculosis. This is an important matter to bring to the attention of ailing workers and their families. Another is the fact that residence requirements for public care are rather strict, and those with limited funds should seek treatment near home.

Statistical studies now indicate that tuberculosis is becoming a disease of older age groups. The rate of decline in deaths has been greater in early adult life than in later years. The shift in relative rates is primarily due to a decline in the reservoir of infected individuals, and a consequent lessening of the risk of exposure. This is a good reason why the "coughs," "colds," or "bronchitis" of older workers should be checked by X-ray examinations in the plant medical department, or by reference to the family physician or health department. Follow up by the industrial nurse is also essential.

The Federal Food and Drug Administration on June 4, 1952 released isoniazid, the new drug being tried in tuberculosis treatment, for use "under close medical supervision." In releasing the drug, which previously had been available for investigation purposes only, the FDA recommended that its use be limited to patients who have already been treated with streptomycin and whose TB germs had become resistant to this antibiotic. The subject is, and will continue to be, under investigation for some time and no false hopes are warranted for a quick and miraculous cure. That is a message that R. N.'s should pass on when necessary.

Dust Control Pays for Itself

(Continued from page 108)

construction has proven highly successful in collecting fine, dry dusts. Most of the dust drops directly into hoppers below the screens, the rest is collected on the screens and is dislodged by automatic screen rappers when the system is shut down at lunch and at the end of the day. Dust from the hoppers is discharged to screw conveyors which carry it to spouts leading to the floor below. Here the dust is collected in 55-gal. drums and recovered for further use.

The total air volume capacity of both systems is approximately 73,000 cfm. To prevent discharged air from whistling and annoying near-by residents, this air is piped through a large "plenum chamber" before being exhausted to the atmosphere.

Pictures by courtesy of Pangborn Corp.

The DISPENSER that's INDISPENSABLE!

THE NEW ALL NEW Lightfoot SUPER SOAP DISPENSER

• it's Super Size!
Carries two full quarts, sufficient for more than 500 hand washings.

• it's Springless!
The last word in trouble-free construction.

• it's Modern thru and thru!
The most efficient and economical of all present day dispensers.

Investigate its other super features: full length observation window, tamper-proof feed control, non-clogging and non-leaking mechanism, theft-proof cover, etc. . . .

Mail this Coupon today!

LIGHTFOOT SCHULTZ COMPANY
663 FIFTH AVENUE, NEW YORK 22, N. Y.

Send me the complete story on your new supersize soap dispenser.

Name_____

Address_____

City_____ State_____

(For details, use the Reader's Inquiry Card on page 115)

What's New . . .

For your convenience in obtaining descriptive literature of products listed here, use the Reader's Inquiry Card. Just write in the code number given with each item. Or send written requests to:

Service Dept.,
SAFETY MAINTENANCE & PRODUCTION

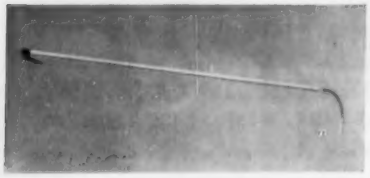
AUTOMATIC CENTERING REELS

(Use Key # 641 on Inquiry Card on page 115)

NOW being produced by F. J. Littell Machine Co., are extra heavy duty automatic centering reels in 5, 10 and 20 ton capacities. The trend toward larger and larger coils has dictated the development of more efficient handling equipment. The spindle type reel completely eliminates rolled over edges and damaged surfaces.

These reels have hydraulically expanded arms which are contracted and expanded by means of hydraulic actuated cams within the spindle. As the spindle sleeve is hydraulically pushed forward, the arms contract to the minimum diameter. As sleeve is pulled toward the frame, the arms spread until the coil is gripped tightly. The cams on the sleeve and on the arms are mechanically interlocked to hold arms in position, both expanded and contracted. The simultaneous expansion of the arms perfectly centers the coil.

The V-type coil-loading car rides on a smooth running track base. The track can be extended from machine to coil storage area, hence material can be conveyed to reel without intermediate handling.



REMOTE MAGNETIC HANDLER

(Use Key # 642 on Inquiry Card on page 115)

TRACERLAB, INC., has developed a magnetic remote handler to make possible the easy positioning and manipulation of radioactive sources, encased in ferromagnetic materials, with increased safety for radiographers.

Weighing only 2 lbs., 15 ounces, the E-32 Remote Magnetic Handler is constructed of aluminum tubing and has a 12", chrome-plated, flexible gooseneck leading to a short, stainless steel tip. A permanent Alnico magnet is encased in the tip and a cast aluminum grip, curved to fit the hand, is depressed to withdraw the magnet from the inner surface of the tip and thus release the source.

Personnel safety from radioactivity is largely based on three inter-related factors: length of exposure, shielding and distance from the source. The new handler, the company said, makes it possible for radiographers to keep a safe distance and thus provides a higher degree of protection. The new handler is stocked in a standard 6' length.

SAFETY AIR HOSE

(Use Key # 643 on Inquiry Card on page 115)

A SAFETY air hose for use on concrete busters, breakers, jack hammers and similar pneumatic equipment to prevent accidents and possible fatalities caused by contact with hidden power lines, has been developed by Mercer Rubber Corporation.

Mercer's Invincible Safety Air Hose has its protection built right into it. Its specially engineered braided copper ribbon of 832 strands forms a high current-carrying medium which is securely bonded in the actual carcass of the oil-proof, abrasion- and heat-resisting hose. Tests by a utility company showed that Invincible Safety Air Hose provides the line of least resistance permitting the operator to safely work in either wet or dry conditions.

An inspection of the original test lengths used continuously for a year in normal service, indicated that, in addition to its safety features, the Safety Hose will considerably outlast the ordinary air hose. Nothing has been spared in design or quality to produce a safety hose that will withstand abrasion, heat, tube flaking and heavy duty working conditions. Invincible Safety Hose is available in ½" I.D. sizes, in 4- and 5-ply construction.

HOT-JOB COVER MITTEN

(Use Key # 644 on Inquiry Card on page 115)

A RECENT addition to the well-known Emalfon line of work gloves, manufactured by the Singer Glove Mfg. Company of Chicago, is an insulated mitten for use on extra hot jobs and which features an asbestos cover mitten that is easily replaced when worn out through long use. The replaceable feature effects a worthwhile saving in cost. This two-piece glove consists of a standard Emalfon mitten, and an asbestos cover mitten that is easily slipped on and off. Both the mitten and cover mitten are reversible, so that the gloves can be worn on either hand.

Singer's Emalfon gloves are made with three thicknesses of material—an outer layer of terry cloth treated to make it flame-resistant; an inner all-wool layer for added insulation and a third layer, next to the skin, of soft fleeced cotton. The addition of the asbestos cover gives the Emalfon glove increased flexibility, comfort and protection, making it outstandingly suitable for extremely hot jobs.

DYNEL WORK CLOTHES

(Use Key = 645 on Inquiry Card on page 115)

A NEW line of Dynel work clothes announced by American Allsafe Co., will have color and style features of sports cloth·s, Lee Churchill, Allsafe's Sales Manager, is promising distributors.

The new clothing, on the job, proves to last up to ten times as long as cotton or wool clothing, Mr. Churchill explains—and at the same time carries swagger pockets, wide collars, characteristic of sports wear. Allsafe Dynel natural and Allsafe Dynel gray colors make the clothes perfectly acceptable for street wear.

Especially desirable in chemical plants, canning factories, dairies, oil refineries, gas stations or any plant where acids, oils, caustics or chemicals are handled—Allsafe Dynel work clothes are sewed with thread as chemical resistant as the fabric. Seven other exclusive features are said to have been included in this new line of work clothes.

KNEE ACTION CASTER

(Use Key = 646 on Inquiry Card on page 115)

THE All Steel Welded Truck Company has announced a new knee-action, shock-absorbing caster engineered for greater economy, efficiency, and safety in a wide variety of handling applications.

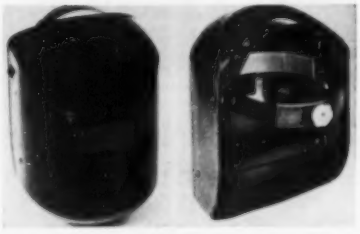
Called the Clark Duoflex Caster, it may be used to replace present wheeled equipment as well as on new equipment. All standard wheels are interchangeable.

Trucks equipped with the new casters will push from two to four times more easily than those with conventional wheels. Reports show large savings in caster maintenance, tire maintenance, replacement, and decreased product damage. Shimmy, or fishtailing, is eliminated because wheels are always kept in contact with the floor.

Deflection is more than 2" in the 10" and 12" sizes, and more than 1½" in the 6" and 8" sizes.

The Duoflex Caster's knee action has lifetime lubrication, and there is only one moving part. Springs are fully enclosed; construction is of the fabricated "boxed" type. The shock-absorbing action features accelerated loading characteristics—acts like a light spring with light loads, and like a strong spring with heavy loads.

Rated standard capacities are available now in small steps from 50 to 1500 pounds per caster in the larger standard casters. Each rated capacity gives action from zero load to twice the rated capacity. Casters rated up to six tons per caster, with deflection in excess of 3", are being designed.

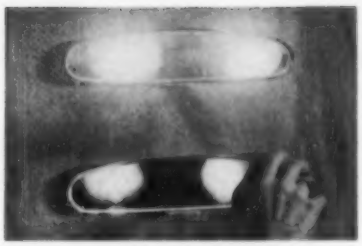


NEW ALL-PLASTIC WELDING HELMET

(Use Key = 647 on Inquiry Card on page 115)

A WELDING helmet, said to be the first seamless all-plastic type, is announced by The Boyer-Campbell Co. The shell is made from a thermo-setting, Fiberglass, reinforced Polyester resin by compression molding. It is exceptionally strong and moisture resistant, will not warp, and unlike other plastic helmets, is lighter than vulcanized fiber. It is easily cleaned and sterilized.

A complete insulating glass holder, made from shredded canvas base Bakelite, provides strength and lightness. There are four different models: Plastic No. 1130 or No. 1136 Lift front; No. 1085 Insulated Steel or No. 1096 Insulated Dowmetal. Filter and cover glass on all glass holders is quickly inserted and held securely in a flexible manner to prevent breakage. A new type "S" four-position adjustable stop is supplied as standard equipment. The headgear on this helmet is also new and is made of an entirely new plastic that does not absorb moisture, which eliminates warpage and the attending discomfort. Has the widely accepted free-floating joint suspension and the quick (ratchet type) headsize adjustment. Flexible plastic headband conforms readily to any head contour to provide for maximum comfort. It can be cleaned with a disinfectant or soap and water.



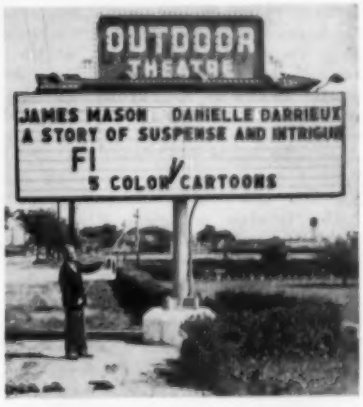
GLARE-REDUCING REAR-VIEW MIRROR

(Use Key = 648 on Inquiry Card on page 115)

A PRISMATIC tilt-type rear view mirror, developed by Pittsburgh Plate Glass Company research scientists in cooperation with Standard Mirror Company, is now available for motor cars.

The mirror operates with a simple flip motion, bringing into focus a secondary or "ghost" image which removes the stinging glare of headlights approaching from the rear. The secondary image provided by the prismatic mirror is sufficiently bright to permit the driver to clearly observe the maneuvers of cars following him without eye-strain.

In the accompanying picture, the mirror at the top is in the closed position, while the lower has been opened to make use of the secondary-image, glare-reducing feature.



SIGN LETTER CHANGER

(Use Key = 649 on Inquiry Card on page 115)

A MEANS of facilitating the changing of copy on changeable copy display signs has been developed in the form of a "mechanical hand" and is being sold by Wagner Sign Service, Inc., Chicago, distributors only.

This "hand" firmly grasps a Wagner letter and removes it or places it on the sign face by use of a tensioning lever at the end of the handle.

The device is particularly useful where the sign is at such a height that copy cannot otherwise be changed without the use of ladders. It can be used only with Wagner letters and is available in 10-foot and 14-foot lengths from any theatre equipment and supply company or Wagner sign representative.

EYE WASH FOUNTAIN

(Use Key # 650 on Inquiry Card on page 115)

THERE has been an alarming increase in the number of accidents involving eyes, ears, nose and mouth resulting from acid burns, dust, fumes, heat and contamination. This in turn has created the demand for an eye-wash fountain that would instantly wet all parts of the face but without danger of recontamination.

To meet the need Logan Emergency Showers, Inc. has designed an eye, nose and mouth wash fountain embodying entirely new principles of spraying. Because immediate, thorough wetting of the face may save precious eyesight, or prevent disfiguration caused by acids, explosions, fumes, heat, chemicals, fire, etc., the Logan Fountain is designed to spray a large volume of water gently at what amounts to neutral pressure. The new design eliminates the danger of back syphonage, or cross-connection and is said to make available an eye-wash fountain that fully meets all known industrial hygiene recontamination regulations and plumbing and sanitary standards.

The fountain comprises a porcelain-enameled bowl with all piping and fittings of red brass, chromium plated. It is actuated by a non-leak, bat-wing valve. It comes in pedestal type, or for wall mounting.

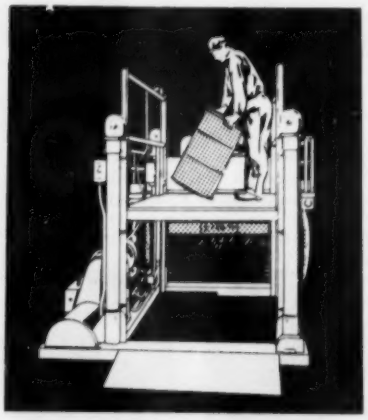
SAFETY DEVICE FOR JOINTERS

(Use Key # 651 on Inquiry Card on page 115)

THE Duro Metal Products Company announces a basically new jointer safety device that takes the danger out of jointer operations, improves the accuracy and quality of the work, and speeds up production.

The new device consists of a system of rollers that hold the stock securely against jointer table and fence without the use of the operator's hands. The operator merely starts the stock under the first roller, then pushes it through with a push stick. The rollers, being slightly "toed in" cause the stock to be tracked over to the fence continuously. They operate over the center line of the stock with only moderate pressure (comparable to hand power) and eliminate any possibility of springing the stock or keeping it from planing flat and accurately.

It works on all sizes of stock from tiny mouldings to heavy timber and will even handle wedge-shaped pieces. On planing wide thick work such as the flat side of a board, this action is positive and reliable.



PORTABLE LOADING PLATFORM

(Use Key # 652 on Inquiry Card on page 115)

THE Atlas Industrial Corp. announces the introduction of a new Portable Loading Platform. This new platform has a capacity of one to three tons, up to 20 ft. range and, can be operated by one man. It is easily moved on retractable casters. The standard platform is 4 ft. x 4 ft., but other sizes are available to meet any requirements.

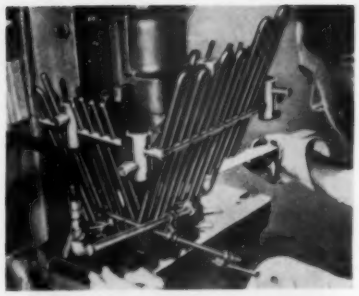
The Portable Loading Platform is electrically operated with either floor or platform control, or both. It is rugged, all welded steel construction. By the use of the Portable Loading Platform, organizations throughout the country have eliminated strain and exertion of loading.

NEW POWER PRESS GUARD

(Use Key # 653 on Inquiry Card on page 115)

A NEW basket enclosure type guard has been added to the line of punch press safety guards and accessories manufactured by Searjeant Metal Products, Inc. The guard has been designed to meet the most exacting safety requirements of users of punch presses of all sizes, makes and types. It comes in several sizes, each custom built to specifications for lower cost and better protection.

The front and side barriers can be tilted in or out as required. The vertical rods can be adjusted up or down to clear the die straps, air nozzles, etc. The whole front barrier can be tilted up or taken off



in a matter of seconds to remove double or damaged blanks from the die.

The corner locking knuckles are so designed that they firmly clamp the round supporting bars without marring them. Slotted mounting brackets enable a quick, easy installation or removal of the guard.

A clear view front can be supplied and is easy to install in place of some of the front vertical rods. This enables the press operator to have an unobstructed view of the die and work area.

FIRE-FIGHTING SHIELD

(Use Key # 654 on Inquiry Card on page 115)

A LIGHTWEIGHT fire shield, made of glass fiber insulation, has been developed by Gustin-Bacon Manufacturing Company, enabling firefighters to approach within a few feet of a fire with effective protection against radiant heat. Weighing only 26 pounds, the shield can be carried by one man. At close quarters, the fireman can either direct operations, turn off valves, effect a rescue or even fight the fire himself.

The secret of the shield's heat-stopping power is a blanket of Ultralite glass fiber insulation fitted to a framework of tubing. Working behind such a shield, a fireman has been able to approach within 18 inches of a high pressure gas fire (850 psi from a 6 inch pipe) in comfort and safety.

The user maintains vision through a "peep hole" at eye level. His face is shielded by copper wire that disseminates and dissipates heat. A self sealing opening for a hose nozzle is easily cut through the shield wherever desired. Ultralite glass fiber insulation is highly resilient and will not dent, break or chip. It is impervious to wetting. Two or three-man shields, on wheels, are also available.

FREE BULLETINS & CATALOGS

As a convenience to executives, these new publications of manufacturers are offered by the Reader Service Department of SAFETY MAINTENANCE & PRODUCTION. To obtain copies write in the key numbers on the free-postage card below.

PERSONAL PROTECTION

Safety Footwear 275
Safety First Shoe Co. A colorful 16-page catalog gives complete information on Safety First steel-toe safety shoes. Included are color reproductions and cut-away drawings of new styles with foam-latex cushioning innersoles. Data on the regular line of work and dress shoes are also given.

Everything for Safety 276
Boyer-Campbell Co. This big 144-page catalog offers a comprehensive line of safety clothing, equipment and devices, including face shields, welding helmets, protective creams, goggles, machine guards, fire equipment, ladders, etc., in short, everything for safety.

Film Badge Service 277
Trecerlab, Inc. A 4-page pamphlet describes the operation of an inexpensive weekly film badge service for the measurement of personnel exposure to radiation from radioactivity, x-rays or radium. It should interest foundries and metal-working plants where radiography is used. The booklet also describes the survey packet to determine radiation exposure by specific body areas.

Orlon Work Uniforms 278
Workion, Inc. The properties and advantages of work uniforms made from du Pont Orlon are explained in this 16-page catalog. Various styles are shown, and the resistance of the material to various chemicals is given in detailed tables.

FIRE PROTECTION

How to Use Extinguishers 279
The Fyr-Fyter Co. A set of colorful instruction tags, showing in easy steps how to use fire extinguishers, are designed to be tied to the extinguishers or posted nearby. The instructions are simple and could be followed easily in an emergency. They are generally applicable to all makes of extinguishers, and the specific types covered are: soda acid, foam, dry chemical, vaporizing liquid, and carbon dioxide.

SCAFFOLDING EQUIPMENT

Tubular Steel Scaffolding 280
Bil-Jax, Inc. A new consolidated 28-page catalog describes and illustrates every item in the Bil-Jax line of tubular steel scaffolding and equipment for construction and maintenance. It also shows how to set up and dismantle various types of rolling, fixed and swing scaffolds; gives results of laboratory load tests, and suggestions for safety.

PLANT MAINTENANCE

Floor Machines 281
Hild Floor Machine Co. Everyone interested in the upkeep of floors and carpeting should get a copy of a new circular giving specifications for six floor machine models. Among the features are adjustable handles and safety switches. Pictures show how nine types of maintenance work may be done by using interchangeable attachments.

54 Maintenance Jobs 282
Oakite Products, Inc. This 16-page digest tells concisely how to perform 54 maintenance jobs in plants and recommends the type of cleaning compound best suited for each job. Typical jobs include floor maintenance, paint stripping, machine cleaning, electrical cleaning, air conditioning maintenance, washroom sanitation, etc.

Heavy Duty Vacuum Cleaners 283
Spencer Turbine Co. A new bulletin describes the redesigned line of heavy-duty portable vacuum cleaners of from 3 to 15 horsepower, including standard electric, belt, and gas-driven units. New features include compactness for passage through factory doors and large capacity dirt receptacles that roll on casters to disposal point.

Open Steel Flooring 284
Open Steel Flooring Institute, Inc. An unusually informative 16-page brochure describes various types of open grating and shows their advantages in relation to ventilation, light, safety, maintenance, etc. Excellent photographs show typical applications in general industry for floors, stairs, walkways and platforms.

TOOLS AND ACCESSORIES

Safety Handrift 285
Custanite Corp. This bulletin describes a malleable metal drift that retains its shape and will not chip, flake, spark or lose its head. A cut-away drawing shows the Flex-Fle construction which gives the tool its unique characteristics.

Hydraulic Tools 286
Blackhawk Mfg. Co. This 64-page "Idea Book" shows the versatility of hydraulic tools in solving production, maintenance, safety and other problems. Included are 1001 uses for hydraulic jacks, pipe benders, knock-out punches, hydraulic pumps, torque indicators and hand tools.

DUST AND FUME CONTROL

Mine Ventilation Blowers 287
Coppus Engineering Corp. Equipment for the primary and secondary ventilation of mines is described in this 8-page bulletin. Well illustrated, the bulletin also gives operating details and complete specifications for the various types of electric and compressed air blowers and exhausters.

Corrosion-Resistant Exhaust Systems 288
American Agile Corp. The properties and corrosion resistance of Agilide, an unplasticized polyvinyl chloride, are outlined in this illustrated 4-page bulletin. Among the product's uses are the construction of exhaust hoods and systems for the handling of chemical fumes.

Dust Collection 289
Agat-Detroit Co. Dusts from food industry mixers, dust and chips from routing synthetics and natural woods, metal chips and dusts from trimming of engravings are among the applications of a self-contained bag-type dust collector described in this 4-page bulletin. Two models are shown, and ratings and recommended uses are given.

Air Conditioning & Control 290
Westinghouse Electric Corp., Sturtevant Div. Of unusual interest is this 60-page catalog covering all types of dust control and air conditioning and divided into three sections: equipment, applications, and engineering data. A "Quick-Finder" chart simplifies the problem of selecting the right equipment for the job.

LABORATORY EQUIPMENT

Planning Kit 291
Fisher Scientific Co. This unique planning kit, which permits complete designing of laboratory rooms without blueprints or conferences, contains scaled cut-outs of 21 ready-made steel furniture units for arrangement on the kit's graph paper. The kit also includes a dimensional booklet and a complete catalog of unitized laboratory equipment.

MATERIALS HANDLING

Pallet Rollers 292
Frank L. Robinson Co. This 4-page engineering brochure pictures and gives specifications for three types of pallet rollers, which simplify the moving of loaded pallets in trucks, freight cars and other areas where maneuvering space is limited.

Lift & Stacking Trucks 293
Lewis-Shepard Co. A new 18-page catalog describes various models of two units of the Master Line of Industrial Trucks. These electric-powered trucks include both fork and platform types. Photographs, engineering drawings, specifications and maintenance features are fully explained.

(Continued next page)

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October, 1952 **Please send me the following free data —No obligation.**

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Company Name _____

Street Address _____

City _____ Zone _____ State _____

Free Bulletins (Continued)

HIGHWAY SAFETY

Fire Protection for Trucks 294

American Safety Tank Co. "Building Fire Protection in the Trucking Industry" is the title of this bulletin, a reprint of an article appearing in this magazine. It outlines why motor fleets must place greater emphasis on fire protection and how they can do it.

Rock Salt Storage 295

International Salt Co. This pamphlet describes 10 different economical methods for storing rock salt for snow and ice removal during the winter. The booklet also offers engineering data on the weight and volume of rock salt as an aid in estimating storage space required.

Burglary Alarm System 296

Victor Truck & Car Alarm Systems, Inc. This new 4-page folder explains the vehicle and cargo protection systems which are now sold instead of leased. Detailed information is given on the system's components: housing, warning signal, concealed wiring circuits to all openings, power supply.

MISCELLANEOUS

Safety Signs 297

Stonehouse Signs, Inc. This bulletin offers some of the more specialized types of accident prevention signs, made according to ASA specifications. Included are signs suitable for hazards encountered in aviation and the poles of utilities. Also illustrated are "Think" and "Be Careful" signs for general industry.

Quick Reading Leaflets 298

Surty Mfg. Co. Quick reading leaflets, designed to increase safety, production, good will, etc., are available on a variety of subjects. They suggest ways of making the working environment safer, more comfortable and less fatiguing.

Combustible Gas Protection 299

Johnson Williams, Ltd. Four types of combustible gas protective instruments are described in this new folder: portable indicator, portable audible alarm, and two types of combustible gas alarms for fixed locations. The folder illustrates the models, outlines their operation, lists accessories, shows typical users, and gives full specifications.

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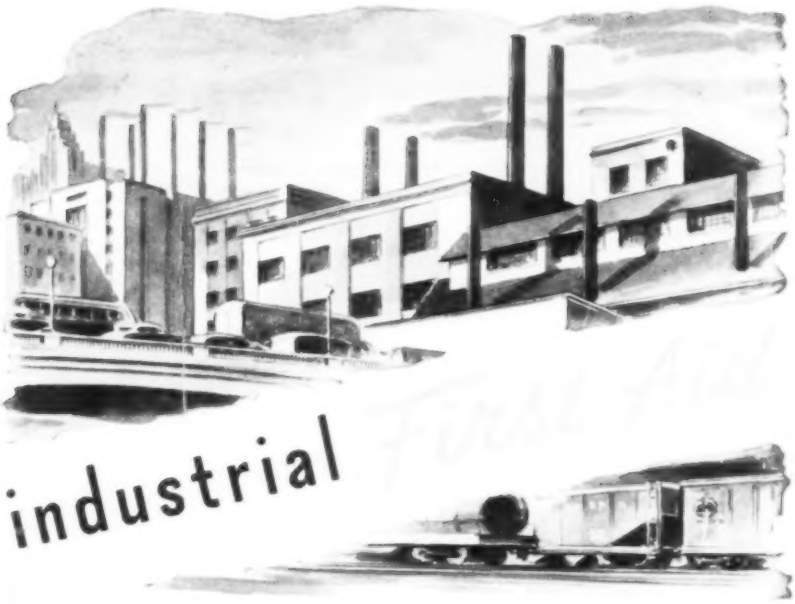

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